SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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2176.—VOL. XLVII. LONDON, SATURDAY, MAY 5, 1877. PRICE (WITH THE JOURNAL) SIXPENCE. PER ANNUM, BY POST, £1 4s.

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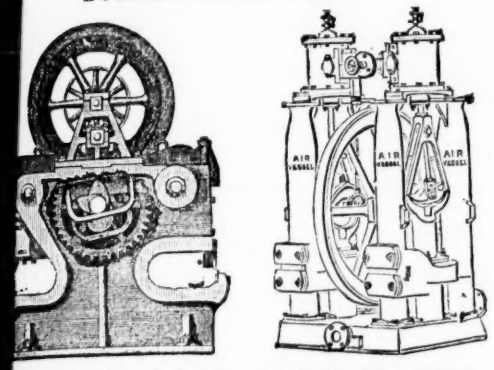

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PARIS, BRONZE MEDAL, 1867.

ORDER OF THE CROWN OF PRUSSIA.

FALMOUTH, SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the Geographical Congress, Paris, 1875—M. Favre, Contractor, having exhibited the McKean Drill alone as the MODEL BORING MACHINE for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE McKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecutive weeks, ending February 7, was 24·90, 27·60, 24·80, 26·10, 28·30, 27·10, 28·40, 28·70 metres. Total advance of south heading during January was **121·30 metres, or 133 yards.**

In a series of comparative trials made at the St. Gothard Tunnel, the McKean Rock Drill continued to work until the pressure was reduced to one-half atmosphere (7½ lbs.), showing almost the entire motive force to be available for the blow against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these Machines for the SEVERN TUNNEL; the LONDON AND NORTH-WESTERN RAILWAY for the FESTINIOG TUNNEL: and the BRITISH GOVERNMENT for several Public Works. A considerable number of Mining Companies are now using them. Shafts and Galleries are driven at from three to six times the speed of hand labour, according to the size and number of machines employed, and with important saving in cost. The ratio of advantage over hand labour is greatest where the rock is hardest.

These Machines possess many advantages, which give them a value unapproached by any other system of Boring Machine.

THE McKEAN ROCK DRILL IS ATTAINING GENERAL USE THROUGHOUT THE WORLD FOR MINING, TUNNELLING, QUARRYING, AND SUB-MARINE BORING.

The McKEAN ROCK DRILLS are the most powerful—the most portable—the most durable—the most compact—of the best mechanical device. They contain the fewest parts—have no weak parts—act without SHOCK upon any of the operating parts—work with a lower pressure than any other Rock Drill—may be worked at a higher pressure than any other—may be run with safety to FIFTEEN HUNDRED STROKES PER MINUTE—do not require a mechanic to work them—are the smallest, shortest, and lightest of all machines—will give the longest feed without change of tool—work with long or short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or open work. Their working parts are best protected against grit and accidents. The various methods of mounting them are the most efficient.

N.B.—Correspondents should state particulars as to character of work in hand in writing us for information, on receipt of which a special definite answer, with reference to our full illustrated catalogue, will be sent.

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DRIVING BED ROCK TUNNELS, SINKING SHAFTS, AND PERFORMING OPEN FIELD OPERATIONS,

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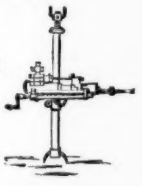

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SUPPLIES MACHINES under the above Company's Patents for DRESSING all METALLIC ORES. Dressing-floors having these Machines possess the following advantages:—

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2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED BY DRESSING-FLOORS IS REQUIRED.

3.—FROM 60 TO 70 PER CENT. OF THE LABOUR IN DRESSING, AND FROM 5 TO 10 PER CENT. OF ORE OTHERWISE LOST, IS SAVED.

4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; London Lead Company's Mines Darlington, Colberry, Nanthead, and Bollyhope; the Stonecroft and Greyside Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Esgairmwyn, and Ystumtuen Mines, in Cardiganshire; Mr. Beaumont's W.B. Mines, Darlington; also Mr. Sewell, for Argentiferous Copper Mines, Peru; the Bratsberg Copper Mines, Norway, and Mines in Italy, Germany, United States of America, and Australia, from all of whom certificates of the complete efficiency of the system can be had.

WASTE HEAPS, consisting of refuse chats and skimpings of a former washing, containing a mixture of lead, blende, and sulphur, DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly profit on our Nanthead waste heaps amounted last year to £600, besides the machinery being occupied for some months in dressing ore stuff from the mines. Of course, if it had been wholly engaged in dressing wastes our returns would have been greater; but it is giving us every satisfaction, and bringing the waste heaps into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines, Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much pleasure in stating that a full and superior set of your Ore Dressing Machinery has been at work at these mines for fully a month, and each day as the moving parts become smoother, and those in charge understand the working of the machinery better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply, and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines, says—"Your machinery saves fully one-half on old wages, and vastly more on the wages we have now to pay. Over and above the saving in cost is the saving in ore, which is not much short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The separation which they make is complete."

Mr. MONTAGUE BEALE says—"It will separate ore, however close the mechanical mixture, in such a way as no other machines can do."

Mr. C. DODSWORTH says—"It is the very best for the purpose and will do for any kind of metallic ores—the very thing so long needed for dressing-floors."

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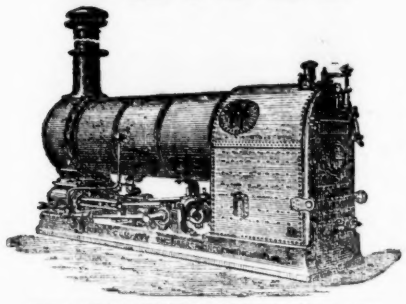
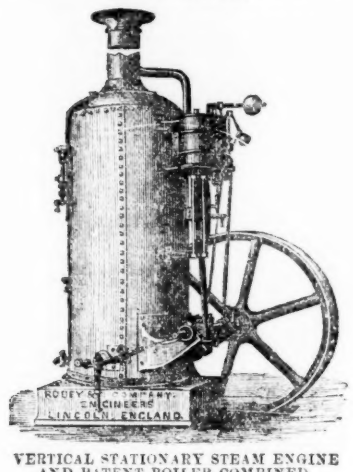
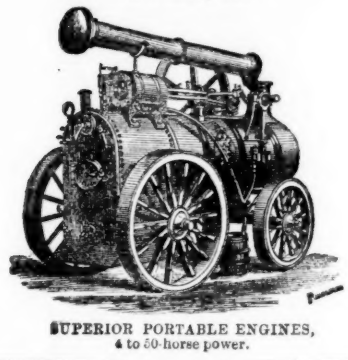


THE PATENT ROBEY FIXED ENGINE AND LOCOMOTIVE BOILER COMBINED,
4 to 50-horse power.



VERTICAL STATIONARY STEAM ENGINE AND PATENT BOILER COMBINED,
2 to 12 horse power.



SUPERIOR PORTABLE ENGINES,
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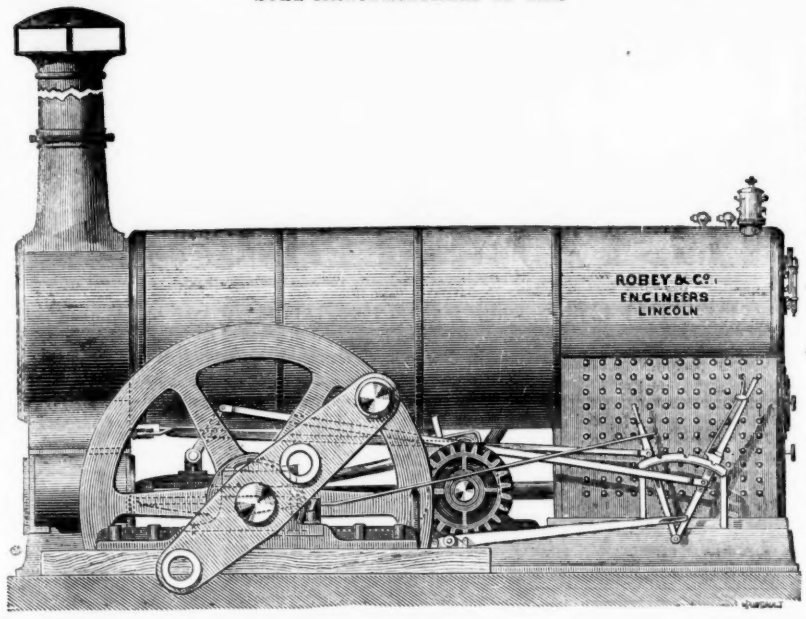
No Expensive Brick Buildings or High Chimney required.



Boiler can be supplied with special Fire-box for Burning Wood, Sawdust, Turf, and every description of inferior Fuel.

PATENT IMPROVED ROBEY MINING ENGINE,

OF ALL SIZES, FROM 4 TO 50-HORSE POWER.

Some of the advantages of this New Engine are as follows:—
SMALL FIRST COST. SAVING OF TIME AND EXPENSE IN ERECTING. EASE, SAFETY, AND ECONOMY IN WORKING. GREAT SAVING IN FUEL.

This New Engine is free from all the objections that can be urged against using the Semi Portable Engine for permanent work, because it possesses the rigidity and durability of the Horizontal Engine, and at the same time retains the advantages of the Semi-Portable in saving time and expense in fixing.

THE PATENT ROBEY FIXED ENGINE

(Also above illustrated) is admirably adapted for driving Rolling Mills, Saw Mills, Brick Machinery, Pumping Machinery, and all descriptions of Fixed Machinery.

ENGINES UP TO 200 EFFECTIVE HORSE-POWER ALWAYS IN PROGRESS.

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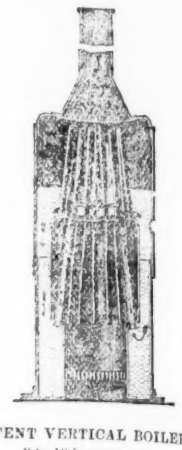
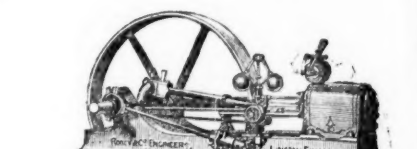


PATENT VERTICAL BOILERS,
2 to 12 horse power.



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(PRIZE MEDAL, INTERNATIONAL EXHIBITION.)

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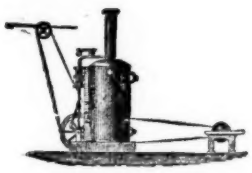
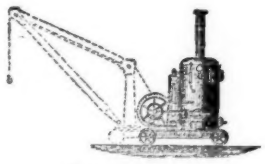
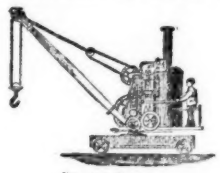


STATIONARY ENGINE.
From 1 to 30-horse power.
No building required.



HOISTING ENGINE.
1 to 30-horse power.
With or without Jib.



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15 cwts. to 20 tons.
For Wharf or Rail.

CONTRACTORS' LOCOMOTIVE.
9 to 27-horse power.
For Steep Inclines and Quick Curves.

SHIPS' ENGINE AND DISTILLER.
For Winding, Cooking, and Distilling
Sanctioned by H. M. Government.

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6 to 20-horse power.

Parties are cautioned against using or purchasing imitations or infringements of these patent manufactures.

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THE EXTRAORDINARY ADVANCE in the PRICE of COALS has DIRECTED more ATTENTION to WATER POWER, and to the BEST MANNER of APPLYING IT. For many years it has been, to a great extent, neglected and undervalued. One great objection to it has been the variable nature of most streams in these countries, having abundance of water during the winter half-year, and very little in the dry season. No kind of wheel hitherto known was able to give the proper proportion of power from the smaller quantities of water, so that it became the practice very generally to use steam entirely during the summer half of the year, letting the water go to waste. This is now completely prevented, and the full available power can be obtained from a stream at every season by using

Mac Adam's Variable Turbine.

This wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth, or even less if required. It is easily coupled to a steam-engine, and, in this way always assists it by whatever amount of power the water is capable of giving, and, therefore, saves so much fuel.

This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the wheel is not affected by floods or back-water.

References to places where it is at work will be given on application to the makers—

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Sole Makers: DUNSTON ENGINE WORKS CO.,
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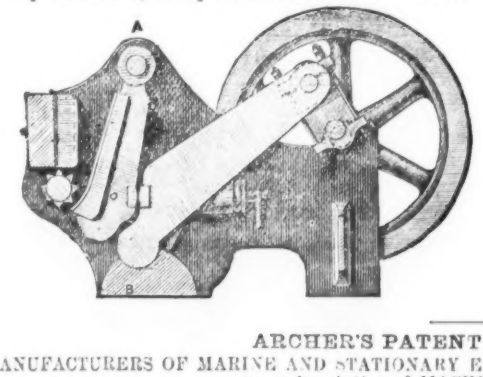
STONE BREAKER,
For Road Metal, &c.

Machines with combined Vertical Jaw and
CUBING ROLLER.

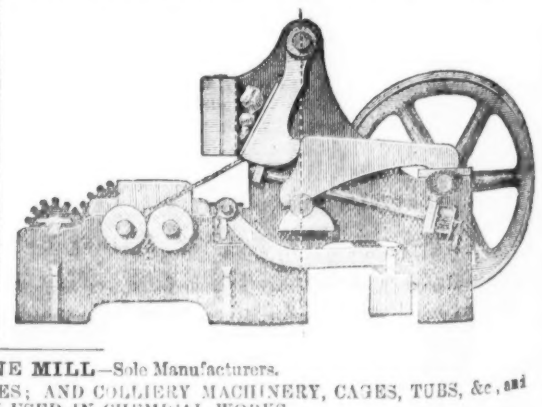
Guaranteed to break more cubical and to make less small than any other Machine.

Simple Machines, with plain Vertical Jaws, without Roller.



PULVERISER,
For Crushing and Pulverising Rocks, Ores, Emery Stone, &c., &c.

Apply for prices and particulars to the Manufacturers, as above.



ARCHER'S PATENT BONE MILL—Sole Manufacturers.

MANUFACTURERS OF MARINE AND STATIONARY ENGINES; AND COLLIERY MACHINERY, CAGES, TUBS, &c., and every description of MACHINERY USED IN CHEMICAL WORKS.

Original Correspondence.

HEAT AS A MODE OF MOTION.

SIR,—Professor Tyndall tells us in his interesting volume bearing the above title, that "in the case of an excellent steam-engine about one-tenth part of the heat employed is converted into work, the remaining nine-tenths being wasted in the air, the condenser, &c." This leaves a wide margin for economising fuel. Again, he says: "In the case of an active mountaineer as much as one-fifth of the heat due to the oxidation of his food may be converted into work; hence as a working machine the animal body is much more perfect than the steam-engine." Have any experiments been made with regard to horses, or other animals? How, in the case of birds, or of fish? Nature's machines that have, moreover, to repair and reproduce themselves consume, it appears, 50 per cent. less fuel in proportion to work done than our first-rate steam-engines. It behoves us, therefore, to enquire in what particulars we differ from Nature in the means that we employ for the conversion of heat into energy or force; how our plans of working differ from hers?

We work our heat engines (that we call steam-engines) at a temperature corresponding to incandescent carbon; when we pass this degree of heat the material of our machine is soon destroyed.—Nature works hers at blood heat, and when this is passed (to fever heat) her machines are also, at times, destroyed.

We throw in our carbon in lumps of all sizes with scarcely any preparation.—Nature carefully grinds, mixes, and prepares her fuel previous to allowing it to pass down the throats of her machines, this mixture being assisted by an active ingredient prepared *ex proso* by the machine itself, called the "saliva."

We allow our coarse and unprepared carbon to come at once face to face with the oxygen of the air that is to reduce it, caring but little as to the form and proportions in which these elements of combustion may come together.—Nature, after having chemically digested and reduced her fuel to a liquid emulsion, called chyle, to which operation she utilises the heat of the machine (or animal) itself, and presents it in due proportions by means of an elaborate system of tubes and cells, called the lungs, to the action of the oxygen of the air, drawn in in corresponding proportions.

We omit this operation of the digestion of our fuel, preferring rather to waste our surplus heat in keeping up (by means of a tall chimney) an in-draught of cold air to our furnace—the lungs of our machine—than to employ it in aiding any such digestive operation. And this, knowing as we do the waste of force incident to this plan of creating a draught.

The nitrogenic atoms, intermixed in the air with the atoms of its oxygen, assist Nature's process by diluting the oxygen, and thus keeping down the heat of combustion to the best and most economical degree—to the low degree at which she maintains it in the processes under our consideration.—We, on the other hand, are in such haste to reach a maximum of heat that these same nitrogenic atoms are a drawback on our crude process, the air so diluted cooling our furnaces as it passes rapidly through them.

Nature maintains her process by the circulation of a liquid (the blood) at about 98° Fahr.—We maintain ours by the circulation of water and its vapour at the greatest heat that we can safely impart to them.

Nature throws off her products of combustion from minute openings, or pores, from the entire surfaces of her machines, as sensible or insensible perspiration, and from the lungs as carbonic acid.—Our products of combustion (also as carbonic acid) are exhaled, along with other half-consumed and unconsumed products, which in the form of carbonic oxide and finely divided carbon are so well and so unfavourably known as the smoke nuisance.

Nature prepares internally the matter wherewith she lubricates continuously her machines, thus impeding dust or other extraneous matters from entering their joints.—We have made some clumsy attempts at an imitation of this process of continuous lubrication with substances that we apply from outside to the exposed bearings or joints of our machines.

Nature envelopes the exposed parts of her heat-producing apparatus in non conductors and bad radiators.—We at times apply the former, but often neglect or misapply the latter.

Sleep, "Nature's soft nurse," dispenses the balm of periodic rest to all her terrestrial machines, vegetable as well as animal.—We, in our greed of gain, often miss our object, and prematurely wear out and destroy our machines (as well as those that Nature loans us), by an improvident neglect of an arrangement as wise as it is in harmony with her seasons.

Further, how as regards the application of the forces that we compass at such a tremendous waste of heat, as compared with Nature's modes of application of her more skilfully produced forces? Nature, though always alike even in her varieties, is not chained down by routine. How admirably does she, at times, accommodate her processes to circumstances?—We, on the other hand, lay hold of some rule, practice, or crochet that in our conceit we call self-evident, and stick to it, as the Spartan boy to the wolf, while it eats out the vitality of our processes; as, for instance, the common adage that the "Horse must go before the cart." When we first attempted by heat, through the medium of steam, to drive our ships on their course, we placed paddle wheels near their bows; then, seeing that Nature propelled some of her ruder water machines (her aquatic birds) by means of webbed feet nearer to their stern, we altered the position of our paddles, placing them more in accordance with her law, till finally some despiser of routine, some daring innovator regardless of ridicule, proposed the location of the horse behind the cart, the screw astern of the ship! an approach, though not as close a one as it will one day be, to Nature's mode of stern-propulsion, as exemplified in her first-class marine machines called dolphins.

As a rule our locomotives go ahead of, and draw after them, our trains, though the now usual method of applying an auxiliary engine behind is an exception to this rule. Is the rule or the exception most in accordance with Nature's modes? Which is or might be made the safest plan? Nature, by the action of her winds, pushes over the lord of the forest into the river; thence the floods drive him down to the ocean. She seems to abhor the trailing of luggage as much as she is said to abhor a vacuum.

My idea—it may be an eccentric one—of the safer railroad of the future is that of a long train of cars with a composite luggage and buffer car astern, and a like composite car ahead, the propelling force being applied in the present, or in some other form, behind the centre of the train.

Returning again to the marine machines of Nature, we find that they only turn over and float bottom upwards after their engines are destroyed—*i.e.*, their vitality extinguished; while ours, at times, upset when under full steam. But where is the innovator to be found who shall propose side floats, or fins, to balance our steamers and guard us against this one of the "many perils of the sea?" Who, again, will dare propose to supplant the screw by an elastic fish-tail propeller and rudder in one?

Should any mechanician with some knowledge of animal and vegetable physiology feel disposed to continue these comparisons he would find much useful matter for study. What are our best valves compared with those that Nature employs in the heart, that pulsates without a minute's intermission from its birth to its death? If we are ultimately to solve the problem of aerial navigation it will be on these principles that we must base our attempts. Balloons, it is proved, cannot be utilised for this purpose. Weight, or terrestrial attraction, is not (even if it were possible) an element to be thrown overboard. We might as well try to accelerate the march of our marine steamers by dispensing with all ballast and cargo; or of our land steamers, by destroying all adhesion to the rails that we place them on.

We may not be able to imitate the flight of birds, but we may obtain much assistance from a study of the principles thereof, not omitting that of the means that Nature employs for directing their flight, for balancing them in the air, and for bringing them safely down to their resting place. As this, for some of them whose habitat is the water, is often on the wave itself; while others, of the air, build their resting places or nests on Nature's atmospheric docks, the trees. So, in the infancy of marine navigation, even large ships were, contrary to Nature's law, drawn almost daily on to some beach ("stant littora puppes")—safe anchorage in bays or docks being but a comparatively modern invention. So, also, this aerial navigation may at first suffer from a similar inattention to Nature's plan of resting places; the time may not be far distant when in, near, or over our principal cities we shall have "docks" for lading and unlading our safely housed aerial ships. WM. A. WALKER.

Valparaiso, March 12.

ROCK DRILLS.

SIR,—I have read with much interest the account of the seven years' working of Rock Drills by Sir G. W. Denys, Bart. From Messrs. McKean and Co.'s advertisement it will be seen that their rock-drills are used exclusively at the south end of the St. Gothard Tunnel, and that the advance made in the heading for eight weeks, ending Feb. 7, 1877, was 215·9 metres, or an average of near 27 metres per week; this is equal to 29½ yards per week, and 1522 yards, or 761 fms., in a year. I have not any further particulars to give as to the size of the heading, the cost of driving, or the pressure of air at the machines; it may, however, be supposed that this work is done by continuous driving, day and night, for six days in the week, and that the machinery, including rock-drills, air-compressors and engines, will be of the best and most powerful description, and the pipes for conveying the air of ample size for the purpose. There will be occasional stops for repairing machinery and the like, which may reduce the driving to (say) 700 fms. in a year or less.

On comparing this with the driving of the level mentioned in Sir G. W. Denys', account, it will be observed there is a wide difference in the advance made in each case; in the latter 550 fms. were driven in seven years, the most of this is stated to be in single-shift, this is eight hours only in 24. By continuous working, however, the level would probably have been driven in 2½ years, the interest on capital for nearly five years would have been saved, and better results in the working of the machinery obtained. I mention this to show that the element of time was, in this case, to some extent disregarded, and the undertaking (which would have taken an age to accomplish by hand labour) might have been carried through in less time than that named, and at a smaller cost.

There is still the difference between 700 fathoms in a year and 550 fathoms in 2½ years. After making the allowance for single shift and, probably, harder rock to work, it may be assumed that with more perfect appliances Sir G. W. Denys' level might in all probability have been driven in one year, and that the full advantage of drilling by machinery had not been attained in this case. The lesson we may learn from this comparison is that drilling machinery should be of a powerful description, in accordance with the work it has to perform, and the work should be concentrated on one level, or at most two levels. The owners of mines would thus have the advantages of the levels being driven and veins opened out in comparatively short time, and at much less cost, for the driving of (say) 500 yards in one year would not, I think, cost more in labour than if only 250 yards were driven in a year, owing to imperfect machinery. M. E.

MONT CENIS TUNNEL.

SIR,—I am able to send you some particulars of this tunnel, taken from various reliable sources. The Mont Cenis tunnel was commenced on Aug. 15, 1857, commencing at Bardoneche, the Italian end, 4380 ft. above the sea level, and at Modane, the French end, 3946 above the sea. The two ends met exactly right on Christmas, 1870. The total length is 7 miles 1020 yards, driven in 13½ years, averaging 1000 yards in a year, and 500 yards at each end. At first hand drilling only was in operation; the air compressors were used merely to ventilate the tunnels. M. Sommeiller conceived the idea of applying compressed air to work perforating machines. These commenced working on the Italian side in 1861, and on the French side in 1863. The compressors were actuated by water power to a pressure of six atmospheres, or about 88 lbs. per square inch. The air pipes were 8 in. in diameter. The drift in which the perforators worked was 12 ft. wide and 8 ft. in height. This was enlarged some distance back to 26 ft. in width and 20 ft. in height.

The rate of progress on the French side was stated to be—
Through 2400 yards schist at 4 ft. per day;
Through 550 yards quartz at 2 ft. per day;
Through 3000 yards limestone at 7 ft. per day;
The remainder, schist, at 5 ft. per day.

In the year 1869 the progress made on the Italian side was 905 yards, and on the French side in the same period it was 660 yards. This was six years after the drilling machines had been introduced on the French side, when they had been greatly improved and altered as experience suggested. The tunnels were driven day and night in three shifts of eight hours each. The depth below the surface at the middle of the tunnel is 5400 ft., no perpendicular shaft being sunk owing to the great depth almost from the commencement of each end. ENGINEER.

MANGANESE BRONZE.

SIR,—A question was asked some time since, through the medium of the Journal, if any of your correspondents could give information if this metal is likely soon to be brought into general use? I have examined each impression since, but have failed of seeing a reply. Perhaps one of our Southwark correspondents could give the numerous readers of the Journal the information asked, and also the progress made in bringing this new metal into use. As from the statements given of its superiority to all other metals, where hardness and toughness are required, it cannot be too widely published or extensively known and used. It would also give a stimulus to the now almost desponding mine owners, which from the continued depression is very much needed. And if this metal was used for plating our war-ships, for which it is far superior to any other, giving a much greater resisting power, and also beyond the piercing power of the heaviest guns yet made at an equal thickness of the best plates now use, we shall hail it with pleasure to know of its being brought into general use, and for the numerous purposes to which it is best adapted, as it will cause the resuscitation of active and vigorous working of our Devonshire and Cornish mines.

Devon, May 2. M. E.

KING'S PATENT MAGNETIC ORE SEPARATOR.

SIR,—It may not be unintresting to the readers of your extensively circulated Journal to have a description of the successful application of the above machine at the Rushen Mine, Isle of Man. A few particulars are due to you personally, inasmuch as the *Mining Journal* "Special Prize" was awarded to the patentee at the Falmouth Polytechnic Exhibition, 1875.

The stuff we are treating consists of blende 65 to 70 per cent., spathic iron 25 to 30 per cent., and iron and copper pyrites 5 per cent., which being unsaleable at a price to pay for carriage had accumulated on the floors to the extent of several hundreds of tons. Previous to roasting it is dried on a horizontal kiln, heated by exhaust steam, and is then ready for the calcining oven. The dimensions of this oven are as follows—12 ft. long by 2 ft. wide by 1 ft. high, which, except the retaining walls, consists wholly of fire-brick. It is heated by a peculiarly shaped furnace at the side, close to the delivery end, the flue leading to the chimney-stack being on the opposite side, at the other extremity of the oven, or the intake end. A stratum of the mineral, about 4 in. thick, is distributed over the whole floor of the oven. The first section (about 2 ft.) which is exposed to the hottest portion of the flame, quickly becomes heated, and the charge is drawn into a recess below the floor. The remaining stuff is advanced at successive stages, a corresponding supply being kept up at the far end. Some experience is required to know when the charge is ready for drawing, for if the right temperature is not arrived at the ores mentioned will not be rendered magnetic, and, on the other hand, if exposed too long zinc fumes are driven off, and consequently the blende deteriorated. We have, however, two things to indicate when it is properly roasted—the colour of the heat in the calcining oven, and the metallic lustre the stuff assumes on cooling, both of which a novice may be made to understand in a day or two. This process renders carbonate of iron and iron pyrites, as well as copper pyrites, magnetic; the carbonate of iron having parted with carbonic acid is converted into a magnetic oxide of iron, whilst iron and copper pyrites, each yielding up one atom of sulphur, becomes magnetic pyrites. The stuff is allowed to cool, and then elevated into a hopper, at the bottom of which is placed a "shaker," to ensure a regular and uniform supply to the magnetic wheel. As soon as it is set in motion the shaker commences to act, and supplies just stuff enough to form a thin coat on the wheel, the iron adhering to it being mechanically removed, and the blende gravitating to a separate compartment. This single operation extracts about 95 per cent. of the iron, and although the stuff we treat may contain from 25 to 50 per cent. of iron, it will assay after treatment 45 to 50 per cent. for zinc.

The questions now naturally suggest themselves—1. What is the entire cost of the arrangement?—2. The cost per ton of clean blende, inclusive?—3. The enhanced value of the stuff?—4. The rate of roasting the raw material?

1.—PLANT:

A. Calcining oven, including stack	£15	
B. Small high-pressure engine	15	
C. Magnetic wheel and accessories	45	
D. Elevators complete	12=	£87

Note.—The magnetic machine may be worked by hand, but a small engine such as we have is preferable.

2.—COST PER TON OF CLEAN BLENDE:

A. Labour	£0	6	0	
B. Coal, at 20s. per ton	0	5	0	
C. Sundries	0	0	6=	£0 11 6

Note.—If a Brunton's or Oxland and Hocking's calciner were employed, this cost would be reduced to 5s. per ton, and fully 50 per cent. more be roasted.

3.—VALUE OF ORE:

After treatment (average of sales)	£3	10	6
Before treatment	0	12	0
Difference	2	18	6
Less cost of process	0	11	6
Positive gain	£2	7	0

4.—RATE OF ROASTING: Per day of 24 hours, 1 ton 17 cwts.; but, as stated, with a calciner worked mechanically this could be more than doubled. It should be observed that the magnetic machine is only kept running about 12 hours per day. If the calciner would supply it our small wheel would dispose of 5 tons per day.

A cursory glance at the above statement will show the practical value of the invention and its importance to mining companies possessing a combination of minerals approximating so closely in their specific gravities as to defy water concentration. All non-magnetic minerals, such as oxide of tin, blende, &c., can be effectually and, with a proper mechanical apparatus, cheaply separated by King's process from those which, like white iron, pyrites both iron and copper, are rendered magnetic by the application of heat. This invention must be particularly advantageous to our Cornish friends, many of whom employ the calciners mentioned for the purpose of making the iron pyrites light enough to buddle away from the tin, by which operation they prepare it without further expense for magnetic separation.

In conclusion, I feel I have not done full justice to the merits of the process, but am convinced that it will secure a name and fame for itself in its future application to the dressing of the more stubborn class of ores. JOHN BARKELL.

Rushen Mine, Isle of Man, May 1.

TIN DRESSING, AND WILLIAMS'S BUDDLE.

SIR,—It may be interesting to those connected with tin dressing to know some of the results in using these buddles. I scarcely need enter on the importance of this department of mining, as all the thought and care bestowed on the various improvements in machinery for winding, pumping, boring, &c., also the dialling, &c., is made satisfactory only by a good tin bill, and this tin bill should, if possible, represent all the payable ore contained in the stuff treated.

Williams's buddle is, no doubt, a modification and improvement on the old round trunks, although it does not follow that this modification and improvement does not effect a good separation of tin from the waste. When the ore and waste have passed through the stamps grates the tin dressers proper commence their manipulations, and the buddle comes in for great attention. Assuming that good tinstuff in the stone contains 2½ per cent. of tin ore, and this tin ore must be made perfectly clean before it should be sold, it is at once seen that a very bulky mass of stuff has to be washed away before the remaining 2½ per cent. can be cleaned. Now, to make this quite understood I will say that the average may be taken of good tinstuff in the stone to contain 56 lbs. of tin ore in 1 ton of stuff. Immediately this is through the stamps grate the tin dresser's desire is to retain the 56 lbs. of tin, and get rid of the 19 cwts. 2 qrs. of waste; or if we measure a gallon of marketable tin ore wet, it would be about 28 lbs. in weight, and if we measure a ton of waste we may say fairly 100 gallons to a ton. We then have 2 gallons of tin ore and 98 gallons of waste in 2½ per cent stuff, equal to half these quantities in 1¼ per cent. stuff. Now, the tin dresser requires a machine of the greatest possible and efficient concentrating capabilities. Williams's buddle has no dead head or centre, only a cup of about 4½ in. diameter, into which the ore and waste fall; the tin accumulating in and forming the centre of this buddle, really occupying the space that in some other buddles is a construction of wood called the head.

Now, at the first operation there is a good separation effected, and the tin at the centre of this buddle has a strong stream of water to stand against, and the lighter waste is hurried back to the tail of the buddle. It will be readily understood that as this buddle has no dead head, that from its centre the radiation and increasing surface is to its greatest. Therefore, although the water is very strong at the centre, having to spread over the rapidly increasing surface, it loses its velocity and volume until reaching the tail or outer extremity of the buddle. The action of the water is only sufficient to take back the waste to the tail of the buddle; this is found not only to concentrate the tin around the smallest possible space at the centre of the buddle, but it also retains the tin, both crop and fine.

For 10 or 12 years this buddle has worked very satisfactorily, and one cleans about 25 or 30 tons of crop calcined ore per month by one man and two boys; it has been found in practice to save 25 per cent. of dressing cost where used.

No patent or protection of any kind has been thrown over this buddle, and its appearance would not lead to any astonishment only for its results. It is cheaply and readily erected and set to work; it costs 5*l.* 5s. complete from the makers, and I have heard that even a lower price has been named. Two men and a boy (masons) fix this buddle, put in the cement floor, and complete it in two days. The result arrived at is (at Wheal Eliza) that nearly 40 tons of tin per month is washed and cleaned by their aid, including before and after calcining, for some 45*l.* to 50*l.* per month dressing cost, including the captain dresser—a sharp, shrewd young man, without rheumatics.

This buddle, too, retains the tin; and as a fair argument in support of this statement, I append herewith a letter from Major Carlyon, the lord of the manor, and who, like other lords, must be feelingly affected at the rivers becoming the recipients of what the adventurers of mines have a right to expect in their tin bills, and that can only be placed on them by work and results (not talking), and efficient machinery well looked after.

For some years elaborate machinery, copied from the Red River of the West, was erected, kept at work, and most assiduously watched not only by tin dressers but by the lord of the manor, who gave every facility to the incomer to make a Red River if he could from the point of outflow from Wheal Eliza to the sea.

Now, Sir, if Williams's buddle cleans the tin—that the last parcel, sold on April 13, made 44*l.* per ton, as shown by the ore book of that mine, and that some 40 tons of tin per month is washed and cleaned both before and after calcining, for a cost of about 48*l.* per month, and the river into which all the refuse and waste is sent (as there is no place to accumulate waste on the land), although washed and streamed for years, resulted in ruin to the washer or streamer, that without desire to influence others, yet you and your tin-dressing readers will, I think, agree in my justification of here saying that

Williams's buddle is a good one, and deserves a place amongst (not apologies, but) other good buddles.

I fear I have trespassed too much on your space, but my desire to give information must be my excuse.

R. H. WILLIAMS, A.I.C.E., and Mem. Soc. Arts.

[Copy of letter from Lord of the Manor.]

DEAR SIR,—In reply to your letter, asking me for information as to the quantity of tin raised by Tresize during the time he was washing the stuff from the Boscundle river, a distance of more than a mile from the sea, I beg to inform you that during the period of upwards of three years which he was working it the amount of tin raised cannot have exceeded 5 or 6 cwts. I was very sorry for him, as he was a very ingenious and industrious man, and expended all his pecuniary resources in erecting elaborate machinery for the purpose he had in view, and devoted the time of himself and family in the energetic perseverance of a task which so lamentably failed. I am afraid this must be attributed in a great measure to your operations in Wheal Eliza, which left the poor fellow very few crumbs to be gathered.—*Stratton street, W., April* 26. T. J. S. CARLYON.

BURRY PORT SMELTING COMPANY.

SIR,—I have been much amused by "Financier's" scheme for the benefit of the creditors of the above company. In the first place, as there appears to be about 140,000*l.* of secured debts in addition to the unsecured, and as this amount is probably secured on the works, &c., the Miners' Mutual Smelting Company (a title which appears to imply that the miners are smelting each other) would have at all events to pay interest on that amount, in addition to their other expenses. Next, I fear that the miners, who are to be paid in pig-lead, will find the results very much the reverse of satisfactory by the time the cost of smelting, loss of lead, and 10 per cent. profit have been deducted, for if any firm of lead smelters has made an average profit of 10 per cent. during the last 10 years I should be very much surprised.

The simple truth is, that for a long time ore has been fetching from 30*s.* to 40*s.* per ton more than its value, and this is the explanation of the disastrous failure of the Burry Port Company. No doubt it has benefited the miners, but it must be borne in mind that should the Burry Port Works be started again in the interest of the miners, and the same policy of reckless buying be continued, the result will be that not only will the Miners' Mutual Smelting Company be shortly wound up, but in all probability some of the other smelting firms as well, which will leave the game in the hands of a few strong firms, who will have then a good deal better time than they have had for very many years. X.

SEPARATION OF MINERALS.

SIR,—The minerals produced from certain mines which are being assiduously forced into notice demanding more than ordinary skill in their manipulation, I think it would be of considerable advantage to some of your readers if any chemists or practical surface captains would state through the Journal what method of dealing with badly mixed ores they have found most advantageous. Those with little or no experience of mining are apt to be captivated by the constant announcement of discoveries of new metals, and too often conclude that if a mine produces tin, copper, lead, zinc, and the precious metals, some of them must surely pay, and that being so no account need be taken of the others. It is difficult to imagine any view more erroneous; it usually happens that when several metals occur together in the same ore the mixture so exists that neither one nor the other can be profitably extracted either by mechanical, chemical, or metallurgical methods. One well tested evidence of this is recorded with regard to a certain mine in one of our western counties, which contained metals of great value, but from the manner in which they were mixed nothing whatever could be done with any of them. Each ton of ore, to take the assays of the chemical engineers which the adventurers entrusted with the treatment of the ore, contained copper worth 5*l.*; tin, 20*l.*; arsenic, 1*l.*; zinc, 2*l.*; lead, 1*l.*; nickel, 12*l.*; cobalt, 14*l.*; sulphur, 4*l.* silver, 14*l.*; gold, 22*l.* = 85*l.*; and when some 300 tons of the ore had been raised the adventurers had a nice balance-sheet prepared, showing that the whole of the 300 tons had cost them (including raising, stamping, directors' fees, office expenses, salaries, and all other outlay) only 16,500*l.*

I believe the process used was that of Messrs. Reid and O'Neil—a process which was sound in theory, if theory be taken to mean what can be learnt from books without actual experience in the laboratory, and while boxes full of products were shown at the London offices of the mine to the delight of the expectant shareholders. As the whole cost of the manipulation of the ores was to be paid for by the by products it will be seen that the fortunate adventurers' balance-sheet showed—value of ore on hand, 25,500*l.*; total expenditure, 16,500*l.*; leaving, so soon as the ore should have been converted into money, 9000*l.* available for dividend. The raising of another 100 tons made the figures stand—value of ore on hand and in process of treatment, 34,000*l.*; total expenditure, 22,000*l.*; leaving prospectively, available for dividend, 12,000*l.*; which, upon a capital of 60,000*l.*, would have been equal to 4*s.* per 1*l.* share. But the products were not turned into money, because such as were obtained, which were little in excess of the few boxfuls prepared for the adventurers, and which might have come from Wheal Sir Isaac or any other mine, were absolutely unsaleable, and less than 100*l.* was actually received for them.

Being sound men of business, the adventurers determined to give other than chance of getting the great prize they could not obtain themselves. The ore which had been treated was offered for sale in the ordinary way. All but two of the smelters declined to purchase there at any price. Of the two willing to become buyers one offered 4*s.* 6*d.* per ton, the other 5*s.* per ton, and the latter had it, the adventurers being scolded by the executive upon the unfairness of the smelter who had deprived them of their expected dividends. But the smelter was, in his turn punished (though whether the adventurers congratulated themselves upon his punishment I do not know), for he expended a large amount in hard cash in his endeavour to separate the metals and employed his best metal urgists, chemists, and workmen, yet he lost more than 250*l.* on the 200-ton parcel, in addition to the 5*s.* per ton he had paid for it. These results were obtained 20 years ago, yet efforts are still being made to deal with equally intractable ore, and that, too, by the employment of men with less integrity and desire to succeed, and with infinitely less knowledge and judgment either as chemists or metallurgists.

While last referring to this old experiment of Messrs. Reid and O'Neil I may mention, although its only connection with the separation of metals is that it is an ingenious invention for extracting gold from the pockets of certain thoughtless investors, that I consider the best interests of mining to be more injured by the new system of premature dividend-paying than by impossible or impracticable chemical and metallurgical processes. It is prejudicial enough to pay dividends out of returns which should be applied to the development of the mine, but at present in nearly a dozen companies even this has been exceeded by the payment of dividends before more than a small proportion of the capital has been subscribed. I may thus explain the principle. Assuming a company to be formed with a capital of 60,000*l.*, in 1*l.* shares, of which 40,000 are appropriated to the vendors and not entitled to dividend until dividends equal to 20 per cent. have been declared, this is the process adopted. Of the 20,000 non-vendors' shares 500 are subscribed for by the vendors' friends, and a parcel of ore being sold, it may be at 6*d.* per ton, a dividend of 5 per cent. is declared. Now 5 per cent. on 500*l.* is but 25*l.*, so that for 25*l.* the mine gains a place in the Dividend List. This enables those interested to place perhaps another 1000 of the non-vendors' shares at par, permits the vendors' friends to find purchasers for the 500 non-vendors' shares they have subscribed for, and probably enables the vendors to sell 1000 of their own. Another 5 per cent. dividend is now declared, absorbing 75*l.* in all this time. The effect being that 1500 more non-vendors' shares are placed, and perhaps 4000 vendors shares disposed of (as the vendors can afford to sell these *as a favour* at (say) 15*s.* per share), and the concern has the appearance of being firmly established.

Taking these figures, it will be seen that 3000*l.* working capital has been obtained, and the vendors will have received, at 15*s.* per share, 3750*l.* No better result can be desired, the 3000*l.* working capital is ample to enable the executive to declare a 10 per cent. dividend, which as only 3000 non-vendors' are issued, absorbs but 300*l.*, so that for 400*l.* the 20 per cent. dividends required to assimilate the two classes of shares has been paid. Of course this is not the way in which the condition would be legally interpreted, but it is the promotors' interpretation, and since by the time it has been paid every outside shareholder has obtained as a favour more vendors' shares at 15*s.* than he has purchased non-vendors' shares at 1*l.*, his mouth is more effectually closed than the Pope can close a Cardinal's. There is now a great noise made that the dividends are regularly paid and increasing in amount, and on the strength of this the largest possible proportion of the remaining 35,000 vendors' shares are disposed of, which effectually prevents the sale of the ordinary shares at par, until in due course the concern goes into liquidation, and the promoters are sufficiently disengaged to re-commence the process in the same or any other district. D. C. L.

Callington, May 1.

THE COAL FIELDS OF CHINA.

SIR,—Baron von Richthofen, who has devoted several years to the investigation of the geology and resources of the provinces of China, and has traversed nearly the whole of the country, stated in the year 1873 that no geological formation is found in China above the Triassic, all the secondary and tertiary strata being absent. The country has, probably, been dry land since the Triassic period. Neither have these existing formations been much disturbed by eruptions since the early primary period, the strata in general laying nearly level, but denudation has taken place to a great extent, forming deep gorges in the river courses through coal and other strata, and removing the rocks which at one time would overlie the coal beds. Coal is said to exist as low down as the Silurian formation, but the great bulk of the coal is found in the true coal strata of Europe, these being deposited about hills of metamorphic and primary rocks, and have been but little disturbed since the time of their deposition. From these ravines coal is often easily obtained by driving in the seams laterally. In Manchouria—the north-east of China—coal is found in the hilly parts, and accessible from the valleys. It is accompanied with rich iron ore in abundance. West of this, near Pekin, the coal beds are 95 ft. thick; in that great city it is generally used as fuel. The coal is got here also from the valleys on the high hills in the neighbourhood.

The coal of Shantung—a province bordering on the Yellow Sea—is the most easily accessible from the sea. In Sze-chuen—a province on the west of China—the coal fields are said to have an area of 40,000 square miles. At the centre of this basin the coal is bad, and not easily got. On its borders the quality is good, and is near water communication to the interior, though far distant from the sea.

The great plain of China is bordered on the west by a high limestone ridge, on the top of which are coal beds in good preservation, owing to the cap of hard limestone on the top resisting denudation. It is stated that there are 30,000 square miles of coal beds of good quality in this region lying horizontally, 30 ft. in thickness. These coal beds extend to the west, into the provinces of Shense and Kansuh, and, it is supposed, northward into Mongolia. The coal fields of China occupy vast areas, but are not provided with means for the carriage of coal. The deposits seem to be not of great thickness. The River Yang-tze-kiang—one of the largest and most important rivers in the world—runs through China from west to east; it is navigable for ships of large class 700 miles from its mouth, or Shang hae, and for smaller ships upwards of 1500 miles. A distance of 1050 miles reaches the western province of Sze-chuen, where the extensive coal field named above is situated, the great river running through the southern part of the province. It has been recently announced that four new trading ports will now be opened to foreigners: these are Hankow, in the Lake district, 650 miles from Shanghae; Shasi, 943 miles; Ychang, in the province of Houpe, 1013 miles; Choong-king, in the province of Sze-chuen, 1400 miles. These places may all be found on referring to a map of China. Railway communication only is wanted to bring coal and other minerals to the great River Yang-tze-kiang, where markets would be obtained for the sale of coal in abundance. M. E.

MINING IN DAKOTA TERRITORY, U.S.

SIR,—About seven or eight years ago the rich silver mines that were discovered in and around White Pine mining district set miners and capitalists nearly crazy with excitement. The excitement reached as far as England, as I expect some people have good reasons to remember, having invested in some that were placed on the London Stock Exchange. Whilst this excitement was going on I wrote you several letters from White Pine and adjoining districts, giving my opinion that the mines were not permanent, neither good investments. I was working in Mineral Hill at the time I wrote you one letter; I mentioned in my letter that Mineral Hill Mine was a lime rock deposit, and not a fissure vein as represented by the officers of that company. The superintendent discovered who wrote the letter, consequently I was discharged. But time will prove, as it has proved, that Mineral Hill, White Pine Mines, and several others, were lime rock deposits. Also that the Little Emma Mine affair resulted only in shaking the confidence of English speculators in foreign mining investments. Some parties might ask how were English companies so easily swindled? Well, the one great reason I know of was that they sent experts out to look after their (the companies) interests that were unacquainted with the formation of the country and the new features it presented.

You are aware, long ere this reaches you, that an extensive and rich gold and silver mining district has been discovered in the Black Hills of Dakota, formerly an Indian reservation, but now United States territory. Since my arrival here I have been surveying and dialling in and around these newly discovered mines, and do not hesitate to say at once that this is the richest gold quartz mining country I have ever seen. The formation of the mineral belt is micaceous slate, in some places capped with sand rock, and in others with white porphyry. The belt seems to run east of south and west of north about 30°, and is extensive, there being rich mines discovered in it from Garden City to Leeds City, and 2 miles beyond the latter place—a distance of 10 miles. The lateral extent of the belt, so far as known, is about 3 miles. Prospecting parties are discovering new mines every day, so that in all probability there will be rich mines all through the belt for a distance of 50 miles before the next winter sets in. The richest mines yet discovered are around Garden City, Gayville, and Leeds City. I could not give you any idea of the richness and number of mines in this belt. There are some noted mines—the Golden Star, of which one-quarter interest was sold a week ago for $25,000; the ledge is 50 ft. wide, with rock that will mill $40 to $50 per ton throughout the whole width. The Homestake Mine for which $100,000 has been refused; the owners (three Frenchmen) ask $125,000, and I do not hesitate to say they have $1,000,000 worth of ore already in sight, as the ledge is from 50 ft. to 100 ft. wide, being on the same vein as the Golden Star. The Clara No. 1 and No. 2, Alpha, and Father de Smith Mines are all very rich.

The Hidden Treasure has the greatest renown, it is a flat vein, from 4 ft. to 10 ft. high, and runs between the slate and sand rock capping. This vein can be traced all through the hills under the sand rock, but as yet no very rich mines have been discovered on it only in the mineral belt. The Hidden Treasure Company cleaned up last month $65,000, and have only a pulveriser to crush their rock of a crushing capacity of 5 tons in 24 hours; they have four men and a blacksmith working in the mine for them. The rock is all broken and easily taken out, so the profits are enormous. There are lots of 10 and 20-stamps mills coming in and being put up, and in my opinion when those mills commence to crush rock there will be greater excitement than at the present time. As yet there are none but small capitalists here buying mines, and mines that are no speculation at all, as each and everyone that has been sold shows more money's worth of ore in sight than it actually cost to purchase the mine. I venture to say at this time that I could purchase over 50 mines, each showing as much and more money's worth in sight than it would cost to purchase the mines. The veins are true fissure veins, and in all probability will be as good to the depth of 100 fms. as they are at present to the depth of 50 or 100 ft. Nearly all the mines are held at present by poor men—the locators of the mines—who are willing to sell for a reasonable amount, so in my opinion there is no speculation at all about buying mines here at present; it is only a question whether a man or company has the money to lay out to get hold of a good mine that in two years from to-day will be worth double, or probably five times, as much as it cost at the present time. Now is the time for English capitalists to invest. My advice is not to lose a day, it is a golden opportunity that is offered to capitalists.

Civil law commenced here on April 1, and everyone who wants a patent or Government title to his property will be able to get it. I say to capitalists, do not hesitate. San Francisco capitalists are here already, buying as quickly as possible, and will in six months hold everything at high figures.

About 10 miles from here is the Ban Buttes silver mining district, the ores are yellow carbonate smelting ores, in a sand rock and quartzite formation. The district is extensive, and presents an excellent opportunity to speculators. The veins are from 1 ft. 6 in. to 5 ft. wide, and assay from $400 to $500 a ton, whilst some run as high as $4000. Capitalists here at present are not paying much attention to the silver mines; they are buying all the gold mines they can. But some of these silver mines are held at as much as $100,000 by the lucky finders, and as I have said before about the gold mines, each and every one of them can be purchased for less money than there is really in sight in the mine. I expect to go there surveying some of these silver mines in two or three weeks, and will then describe them to your readers more minutely.

THOMAS H. WHITE,
Civil and Mining Engineer.

Deadwood City, Lawerance County, Dakota Territory, April 5.

THE THARSIS COMPANY.

SIR,—When I wrote you two weeks ago I was in hopes that the Chairman at the annual meeting would explain how the very large reductions in the prices of copper, sulphur, and iron ore compared with previous years had been made up, but he does not throw a single gleam of light on the subject. It certainly could not be by any reduction of the costs, for all he states in regard to them is that "they compare favourable with those of last year." Where, then, can the enormous sum of 157,000*l.* be saved? The Tharsis Company have no exclusive rights in the extracting and cementation processes. There is a rumour afloat as to a re-valuation of the grounds belonging to the company. It would be perfectly legitimate to do this; but, if so, why not state it. The Vice-chairman is apparently desirous, by the remarks he made at the annual meeting, that the public should invest in the stock at once; as one of the public, I ask him to explain more fully than the Chairman has done the position of the company, especially in the face of the great fall in the price of copper—fully 7*l.* per ton—and the great premium on the stock in the market, and the increasing competition and enormous production of copper by the cementation process of the Rio Tinto Company.—*Glasgow, May* 2. PYRITES.

COMPRESSION VERSUS EXPANSION.

SIR,—Nature has again interposed to convince mankind as to the fallacy of ventilating collieries upon any principle necessitating an expansion of air, as instanced at Hartley, where upwards of 200 fellow-creatures were poisoned or suffocated by slow degrees within an hour or two of the arrival of human aid, when all would have been saved had they not been deprived of the means of respiration. In this case many miles of open and unobstructed roadway contained such means of life in the usual condition of pit air obtained by furnace traction, but at Tynewydd the entombed miners had no more than a few yards of open space in which the breath of life was not denied them, and thus guarded by an atmosphere accidentally compressed, they miraculously survived for nine whole days and nights upon a few candles, whereas the Hartley victims had plenty of good corn and water.

Within a week after the funeral at Hartley I proved at Montague Main Colliery, Scotswood, that by the simple means of propulsion then in use at that pit any extension of compression might be easily obtained, maintained, circulated, and secured, so as to resist the influx of either gas or water. The Government Inspector of the district heard from the mouths of the owner, manager, and men that they considered an explosion to be impossible with such an air supply; still, I have laboured in vain during the last 15 years to convince those concerned that the 400,000 human beings who labour in British collieries may be absolutely protected during their dreary toil from either explosion or inundation.

I confidently repeat my belief that if the fatal pit at Hartley had contained an air supply equal to that at Scotswood, or in the same ratio as the adit in which the men of Tynewydd survived, every man, boy, and horse in the former pit would have been saved; and if in the latter case the whole colliery had been filled to compression, I verily believe the inundation would have been harmless, and every human being in the vein would have had a safe time to quit the pit. On the score of humanity I once more crave the attention of all in charge of human life in collieries to my statement in your Journal of Jan. 29, 1876, and to say that I am still willing to devote my services gratuitously to a repetition of the experiment at Montague Main pit, in the presence of all viewers and other scientific men who may desire to be present, if the owner, Mr. Benson, will consent, according to former promises, and I have no doubt he will. In this case the future means of ventilation will assuredly supersede the furnace, together with an immense saving of expense.

Southtown, Yarmouth, May 2. C. COLWELL.

COLLIERY INUNDATIONS, AND THEIR PREVENTION.

SIR,—The recent melancholy accident at the Troedyrhiw Pit reminds me of a very excellent paper on the cause and prevention of colliery explosions, by Mr. Thomas Joseph, read before the South Wales Institute of Mining Engineers some six years ago, and the thought occurs to me whether the adoption of his system of working would have the same effect in preventing inundations as in preventing explosions. Turning to the *Mining Journal* of Nov. 18, 1871, I find that you gave some excellent diagrams prepared from his paper, and I think there can be no question that although working to the dip secures a clearance of gas, it would add rather than diminish the danger from water, and the Troedyrhiw accident affords me further evidence that what I have so often advocated is the correct system of working. The shafts should be put down so that the one shaft, by preference the downcast, should descend to the lowest portion of the seam within the royalty, and that the other shaft should be on the rise side, and at the farthest possible point from the downcast. It may be said that this would involve waste of time in getting the colliery into condition for sending the full output of coal to market. I know it would do so, but the difference in time would not be great, and the colliery could ever after be worked both more cheaply and more expeditiously, so that the delay of a few months would be far more than compensated.

The Act of Parliament would permit 20 men to be employed at each shaft, so that the work could really progress very rapidly. As soon as the shafts were down to the required depths they would be connected by an air level running as close to the boundary of the royalty as it is intended to work. The air-way being made the output of the coal for market would be large and continuous. From the upcast the coal all along the rise boundary side of the royalty could be taken by the method of working—long wall, or pillar and stall—determined upon and from the downcast all the coal in the direction of the rise of the seam could be similarly taken. But this is not all. There would be no difficulty in constructing a second air-way round the opposite side of the boundary. To be more explicit; the first air-way would run rising with the seam, and thence along the rise boundary from the downcast to the upcast; the second air-way would run along the dip boundary, and then rise with the seam from the downcast to the upcast. From the second air-way two sets of workings could be carried on similar to those I have described for the first. The workings on each air-way would be in the position of an absolutely distinct colliery. Each section would have

its own ventilating furnace, though using the same upcast pit. An explosion in one would scarcely affect the other, and certainly would cause no loss of life there. The gas would, as Mr. Joseph states, be drained off as it escaped from the coal, and in the event of such an inundation as at Troedyrhiw the whole of the men would have ample time to escape, and could not be enclosed. I have had no opportunity of seeing plans and sections of the Troedyrhiw Pit, but if coal were, as a principle, worked upon the system I have pointed out, I believe that the risk of accident would be much lessened.

As to the proportion of coal that could be won, I believe it would be much greater, especially if a kind of long wall working were adopted, working inward from the angles of the royalty other than those having the shafts until a pillar—say, 200 ft. thick should be left diagonally between the two shafts. This would be similarly removed from the upcast to the downcast pit, the necessary supports being, of course, left or built, and the pack roads, &c., properly constructed, so as to ensure safety whilst the last of the coal is being removed. I shall be glad if Mr. Joseph would give his opinion as to whether this modification of the plan would not be beneficial.—*Durham, May* 1. ENGINEER.

WAR—HOME INVESTMENTS, AND FOREIGN BONDS.

SIR,—War has become a reality; the fanatical Turks await the invasion of the jesuitical, treacherous, and semi-civilised barbarians of the North. Russia has revealed her sinister designs, and all Europe watches the current of events, firm and determined to resist the conquest of territory and acquisition of power by the Muscovite in Asia, and especially so as regards the Bosphorus, the Sea of Marmora, the Straits of the Dardanelles, Egypt, or the Mediterranean. The present glut of foreign stocks interferes with all home financial and industrial enterprises. It is fortunate, however, that the cessation of dividends by many defaulting States and the ascertained insolvency of others have at last opened the eyes of the too credulous, though equally greedy, English capitalist to a practical knowledge of the fact that high rates of interest mean, likewise, bad securities.

To make the most of investment there must be no sloth, no inertness. The investor must inform himself and act from time to time without that *dolce far niente* which lolls supinely upon money bestowed by fortune. To become a successful investor one must possess knowledge, judgment, nerve, and money. Knowledge is the product of study; judgment is a natural gift, assisted by knowledge, and, indeed, impossible without study; nerve is also a natural gift, but that, too, may be cultivated by the abnegation of excess and by moderation in all indulgence; the possession of money may be accidental or it may have been earned by the possessor, but, taken in the long run, money belongs to the man who has the power of will to grasp and to retain.

Some men of intellect devote their time, energies, and money to a betting book, thereby showing that their native talents require naturally some vent in buying and selling. Again, others have sought the excitement of foreign bonds; while, to further illustrate the subject, others seek the gambling table, and rouse their apathetic intellects into exercise through the fascination of imaginary gains *versus*—in by far the greater number of instances—certain losses; and if these be some of the conditions of human existence, why should not these propensities or proclivities be directed to some useful channel, as railway shares, telegraph, or mining shares, gas, water, canal, dock, building, shipping, manufacturing, or construction shares. These are all valuable to somebody, and do no harm to anyone? All the world has profited by railways and mines, but the investing public in England has never profited by foreign bonds, horse racing, or the roulette table.

In the midst of all our distrust and lack of enterprise home industries continue to pay well. Insurance, banking, and finance company pay substantial dividends, ranging from 5 to 10 up to 20 and in cases 50 and up to 80 per cent. dividend on capital subscribed, as may be instanced in the following cases, and which are strong evidences of the soundness and prosperous condition of our home and foreign trade, manufacture, and commerce—Rock, 80 per cent.; Caledonian, 32½ per cent.; Lancaster, 20 per cent.; Law, 20 per cent.; Liverpool 40 per cent.; Manchester, 20 per cent.; Maratime, 20 per cent.; National, 20 per cent.; North British, 28 per cent; Northern, 20 per cent.; Royal Exchange, 32 per cent.; Royal Farmers, 20 and 17½ per cent.; while many other insurance companies yield from 15 to 20 per cent. dividends. As regards joint stock banks the Aberdare, 15 per cent.; New South Wales, 17½ per cent.; New Zealand, 15 per cent.; Bank of Scotland, 14 per cent.; Whitehaven, 22½ per cent.; Belfast, 20 per cent.; Birmingham and Midland, 22 per cent.; Birmingham Joint-Stock, 20 per cent; Bradford, 18 per cent.; Burton, 22 per cent.; Bury, 25 per cent.; Carlisle, 24 per cent; Commercial Sydney, 25 per cent.; County of Stafford, 21 per cent.; Cumberland, 20 per cent.; Hampshire, 20 per cent.; Lancaster, 32 per cent.; London and County, 20 per cent.; London and Westminster, 14 per cent.; London Joint-Stock 17 per cent.; Manchester and Liverpool 20 per cent.; National Provincial of England, 20 per cent.; Whitehaven Joint-Stock, 25 per cent.; Wilts and Dorset, 24 per cent.; York City, 20 per cent.; Yorkshire, 24 per cent.; and York Union, 17 per cent.

Home mines have already yielded for the first quarter of the current year—Bryn Alwen, 8⅞ per cent.; Great Laxey, 12½ per cent.; Grogwinion, 10 per cent; Leadhills, 5 per cent.; Minera, 8 per cent.; Roman Gravels 11½ per cent.; Tankerville, 4 1-6th per cent.; Van, 18 per cent.; West Chiverton, 6⅝ per cent.; South Caradon, 240 per cent.; South Condurrow, 6⅝ per cent.; Dolcoath, 2½ per cent.; and Tincroft, 2⅜, while the discoveries made at Peavor, Mellingar South Crofty, Penstruthal, Agar, Cathedral, Mooyld Gorddu, Van Consols, and lastly, Pateley Bridge, and Trebeigh Consols, when practically worked and fairly introduced to public notice by men of commercial repute and practical mining knowledge. At this moment money is superabundant; yet, as we before observed, commerce and industry languish for want of its support. Capital and labour are the true parents of national as well as individual progress and wealth, while they must stand indissolubly united to ensure success. Why, therefore, should they stand, as at present, thus amalgamated, yet practically divorced? We say because the relations which bound them together were false in principle and untenable in character. Too much money has left the country. Russia, Turkey, Egypt, Peru, Spain, Portugal, Italy, America, Austria, and almost all other countries and states, have been borrowers, and the greed of Englishmen have now only the promisory and worthless bonds, payment of which international laws prevent recovery through pressure, and the simple honour of these communities are at stake, while we can estimate the promises, honour, and diplomacy of the greatest potentates through the intrigues, chicanery, duplicity, and deception of Russia, who after a game of "shuttlecock" with the great powers of Europe is now earnestly striving to extinguish the Turk, and to deluge the Western Continent in blood and carnage.

Now that the dogs of war are set loose it becomes us all to reflect on the nature and character of the securities we possess in exchange for our money. No one could for a moment value the bonds of Russia on a footing with the Rock and many other insurance companies, nor could they estimate Austrian, Italian, or Egyptian with the London and Westminster, Bank of Scotland, or the Bank of Ireland, say naught of the Bank of England.

Again, few would hazard an opinion in favour of Peru, Spain, Honduras, Turkey, Greek, Hungarian, Paraguay, Mexico, and Venezuela Bonds in juxtaposition to such mines as the Van, Roman Gravels, Tankerville, Great Laxey, Grogwinion, Leadhills, and the Minera. These mines employ thousands of labourers, have yielded millions of produce, have benefited the workman, trader, and manufacturer, increased the volume of trade, and added greatly to the wealth of the nation. The mines are in the Mother Country; the miners are fellow workmen in the strife for existence and supremacy at home; the capital and products are retained amongst the community; through its circulation trade, manufacture, and commerce augment and expand; though in instances individuals may unhappily lose yet the nation prospers, and its wealth increases through the profits and the products of the mines, and the gains of trade and commerce allied with and springing therefrom. Not so, however, in lending money to the foreigner. The mines they work are out of this country; the railways and other undertakings which they construct, the labour and material allied therewith, the revenues springing therefrom, the money advanced, the properties themselves, employment engendered, and the several advantages of every kind and character are lost to this country for ever. The foreigner possesses the whole, and at our expense, with no solid advantage whatever to this nation, and which, unhappily, at one moment, as the cycle of events comes round, is as lavish and careless in its reckless adventures as at other epochs and cycles it becomes obstinate, stubborn, and distrustful in its dealings, while all the greed and animus of the animal extinguish enterprise and stifle progress.

R. TREDINNICK,
81, *Bishopsgate-street, May* 2. Consulting Mining Engineer.

THE CONCENTRATION OF COPPER ORES, &c.

The writer of "Cousin Jack's Unpublished MSS." begs to inform "C. H." (Scarborough), see page 461 in last Saturday's Journal, that he never saw Mr. Barnard or any of his mines, and knows nothing whatever of him or them, or anybody who was or is connected therewith. It is quite true, as stated, that the ore washed away gave 17½ per cent., and what was saved gave 7½ per cent.; rich copper ore, tin, silver, and gold will "swim," and until "Old Tom's" plan of dry separation or dressing is carried out the loss in mines will be, as it has been for generations, incalculable. The writer, as stated in a former paper, saw a Cornish manager of a mine having hutchwork washed with a powerful stream of water in a long strake, with the view of separating the ore—by washing it back to the tail of the strake—from the heavy waste which remained at the head. At the last meeting of the Institute Capt. Teague is reported to have said—"If they were dealing with rich stuff there would be tin in the tail of the huddle, but with ordinary stuff they would not find tin in either the large or small huddles." Mr. J. H. Collins—"I say all your tails will produce 3 lbs. to 1 ton, and some as high as 9 and 10 lbs." It seems very mysterious how so much tin finds its way to the "Red River," or that with the concentrated wisdom and experience of all the members of the Institute they cannot discover some plan of preventing so much tin from slipping between their fingers? Or is it a question of "Heads and Tails"—heads I win, tails you lose.—*May* 1.

CAPTAIN TREGAY, AND MR. GRANVILLE SHARP.

SIR,—Mr. Granville Sharp apparently feels great pleasure in abusiveness, and in asking questions. Now, I have no time to appropriate to the exchange of Billingsgate, or in answering any of his questions, but inasmuch as he has made this week in the Journal inaccurate statements, I must ask you to allow me a small space to show his inaccuracy. Mr. Granville Sharp, in his letter on myself and Pedn-an-drea Mines, has commenced in error by saying that this correspondence arose in the first instance from some remarks made by him at a public meeting, whereas he knows very well that it arose from a deliberate and unprovoked attack made on myself by him in the columns of the Journal. As to his remarks at the meeting to which he probably refers, I was not present, but from all I hear respecting the affair it would appear that Mr. Granville Sharp was at that time too intensely excited to be quite accountable for all his rambling remarks.

Mr. Granville Sharp is at perfect liberty to defend "W. X.," nothing more natural, for if one hat does not cover the both they are so exactly alike as two little nigger boys. Mr. Granville Sharp states that he has seen the official balance-sheets, and that the loss for 14½ months was 16 525*l.* Now, allow me to tell him that if he had seen the balance-sheet and understood ordinary accounts, he would have seen that his statement is not true. He would have seen, or should have seen, that the tin credited in balance-sheet June, 1875 was one month later than cost, and that another month was estimated up to middle of July, 1592*l.* for tin and copper ores. Consequently, we have tin, &c., sold during 12½ months only to come against 14½ months cost—*i.e.*, 16 financial months, or 64 weeks cost against 56 weeks sales. Thus we have June, 1875, balance-sheet—

From May 14, date of last cost, to June 11	£1320	6	9
Estimated tin and copper ore up to July 14	1592	0	0
In March, 1876, balance-sheet—			
Merchants' bills brought forward from a former period ...	1769	9	7
And in September, 1876, 470 shares unissued, for which the company had to be debited	940	0	0
Showing, that over current loss, a balance of	£5621	16	4

had to be provided for, and was part of the 16,525*l.*, which Mr. Granville Sharp represents as having been lost in the last 14½ months. This I think a rather respectable amount, and fully justifies my statement that Mr. Granville Sharp is in error.

He next says that the calls made in same time amounted to 15,820*l.* But we have, even before the last call, 5391*l.* 18*s.* 5*d.* arrears of call, the greater part of which arrears arose out of calls made within the period referred to, and this it was which rendered a 10*s.* call at the last meeting necessary, providing, if all paid, 4520*l.* to meet a debit balance of 1801*l.* 11*s.* 9*d.*, consequently if these calls were paid up a good dividend would come back. Now, it is of no use whatever for Mr. Granville Sharp to dispute the above statements, for there are people who understand mining accounts as well as he does, perhaps a little better, and the company's books and balance-sheets will prove everything I have stated at any time on the subject. Mr. Granville Sharp's letter being, as this shows, altogether in error, either intentionally or not, he winds up by saying "perhaps one must not be surprised at any statement he may make." Now this sentence is so accurately applicable to a man who is deliberately pressing false statements and accounts before the world, and trying to force belief of what is utterly untrue, that it may be worth Mr. Granville Sharp's while to examine his figures a little more closely before writing again on this subject, lest his own remark be taken as a just measure of his own character.

Redruth, May 2. W. TREGAY.

CAPTAIN TREGAY, AND PEDN-AN-DREA MINE.

SIR,—Being well acquainted with the facts relating to the sale of Pedn-an-drea, I have read the correspondence in the Journal relating to it with some interest, and I feel bound to remark that a more unwarrantable attack than that made upon Capt. Tregay has seldom come within my observation. Mr. G. Sharp's letters and those of "W. X." harp so exactly upon one string that I will class them together, as it appears unlikely that they can have emanated from any very different sources.

Was "W. X." really so sanguine as to think he had a chance of frightening Captain Tregay, and making him feel called upon to answer his questions, such as they are? "W. X." appears to assume that he is entitled to put as many impertinent and insinuating questions as he likes, and to get answers to them, but the days of the Inquisition have passed away for ever, and I think Captain Tregay quite justified in refusing to acknowledge such an authority. The moment there was the shadow of an answer to one of his questions "W. X." hastens to accuse his opponent of making false statements, and yet nothing can be more diametrically opposite the truth than the statements, figures, and insinuations "W. X" tries to palm off upon the public. First, he charges Capt. Tregay with being a stranger to the truth, and still he cannot prove that one false statement has been made by him. Then he insinuates that truth is inconvenient to his opponent, but this he can hardly advance, seeing that "W. X." has not made one true remark on the subject of this correspondence, whilst Capt. Tregay can, I know, substantiate every word he has said or written. After this "W. X." goes on to say that no balance-sheet was issued in February. But there must have been a balance struck in February; if not, then let anyone examine the balance-sheet issued in June, 1875, and in March, 1876. We find in the first the total sales of mineral and total costs considerably below the amount brought forward in the latter on both sides of the account. If no balance sheet had been struck between these two periods, how could this be? To assert there was not is clearly absurd. In the last balance-sheet issued by the late company you will find arrears of calls—5391*l.* 18*s.* 5*d.* Does "W. X." charge Capt. Tregay with having spent that money also? If he had done so he would no doubt have opened out the mines even more effectually than he has, and they are not by any means badly opened out now. In this case the probabilities are that the company would never have been wound up.

May 2. ARGUS.

CARDIGANSHIRE MINES, A.D. 1877—No. XIII.

SIR,—Resuming my remarks, I will commence with Bwlch Consols, situated on the Goginan dé, and to the east of it; and, although the workings have not reached as deep as the Goginan adit by some 50 fms., they have yielded many hundreds of pounds worth of rich lead ore, and for many years seemed to be in a most flourishing state. Strange to say, for the last three years the mine has remained idle. I had hoped from a letter which appeared in the Journal some time back, from the able pen of Mr. J. Y. Watson, advocating re-working the mine, that it would have been at work long ago, but such is not the case, and it can only be regretted that such a valuable property should lie dormant when a small capital judiciously expended would return a high percentage, give employment in this district, and pay the owner of the land something to which he is entitled. I returned as much as 130 tons per month from one bunch of ore, and gave very large profits, and continued to do as long as it remained in my hands, and I do not hesitate to say I could do so again.

We next have the Cwenant Mine, further east than the last mine mentioned, and on the same lode. Very little has been done here for the last three years, and it is surprising that it is left without being extensively worked. For some years this mine was also under my control, and although no machinery was erected we managed to make good returns and large profits. It will be useless to say more than this—that if properly worked the mine is certain to prove a very profitable investment.

Next comes the Penerain du Mine, which has yielded a very large quantity of ore near the surface without the aid of machinery, and to my own knowledge I can vouch for a very rich coarse of lead ore being left in the bottom of the old workings. This mine only wants machinery erected to make it permanently profitable. As in the last two instances mentioned little or nothing has been done during the last three years.

What a gloomy picture to place before your readers! What a happy one to say that within the last few weeks the great mines of Esgair Hir and Esgair Fraith have made a fresh start; that the Tiny Iron, a very rich mine, has also been settled, and will start before this appears in print; that the late rich and profitable Cwm Erfin has been placed in the hands of a gentleman who will work it energetically; and that the writer of this article has been instrumental in leading to this result. Many good discoveries have recently been made, and I am pleased to be able to conclude by saying we seem to have a bright and sunny side for the future of Cardiganshire.

Goginan, May 2. ABSALOM FRANCIS.

PROSPECTS IN THE GWENNAP DISTRICT.

SIR,—It is at all times pleasing to communicate intelligence calculated to lead to beneficial results as regards the parties immediately interested, and more particularly when the public must participate. I have long advocated the development of new or unwrought ground as being the only thing to revive Cornish mining, and within the last week a discovery of copper ore such as has not been witnessed for many years has taken place in a mine called Wheal Comford, worked in a very unpretentious manner by about 15 shareholders, who have spent about 2500*l.*, for which they are now to reap the reward of their small but judicious outlay. This mine is situate between the celebrated Tresavean and Penstruthal, two of the richest mines Cornwall ever owned. The former, on an outlay of 32*l.* 10*s.* per share, sold in the market for 2700*l.* each and paid profits close upon 500,000*l.*, while the latter paid the fortunate shareholders 80,000*l.* in dividends in one year. Wheal Comford is in the centre of the very hotbed of this great mineral district; and, having the same cross-courses which enriched the lodes of those two mines, it cannot fail to revive the remembrance of the brilliant era of Gwennap copper mining of former days. At about the depth of the present discovery of copper ore (60 fms. from surface) the greatest mines of Gwennap commenced being ore-producing, proving more and more productive in depth, and paying larger profits than any mines in the other districts of Cornwall, and it is confidently relied on that an extension of development only is required to ensure the realisation of a copper mine of very great value. There are many such pieces of unexplored ground in the immediate neighbourhood, requiring only the operations of the miner, aided by a similar small outlay of (say) 2000*l.* or 3000*l.* at most to ensure the like success, one of which will shortly be offered by the writer having all the characteristic conditions of the richest lodes in this great mineral district.—*St. Day, Cornwall, May* 3. CHAS. BAWDEN.

MINES AND MINING IN GWENNAP.

SIR,—I think I am correct in saying that of all the parishes in the county of Cornwall no one has yielded so much metallic property as that of Gwennap. Several parishes—Breage in particular—have yielded more tin than Gwennap, but not one parish has equalled it in copper. The principal copper mines in Gwennap, formerly productive, are the following:—Consols, United Mines, Wheal Clifford, Wheal Friendship, Wheal Squire, Tingtang, Wheal Damsel, East Damsel, Carharrack, Wheal Maid, Police (tin also), Wheal Unity, Wheal Unity Wood, Wheal Jewell, Wheal Gorland, Treskerby, and Wheal Chance. Some of these are said to be in a state of exhaustion, such as Consols, United Mines, and a few others, but some of them would probably pay if re-worked for copper, as Tingtang, Wheal Damsel, Treskerby, &c., but I suppose that to work Treskerby would involve the drainage of the adjacent mines—Halenbeagle, &c. Tingtang is not a deep mine, and would in all likelihood repay with good interest the cost of outfit necessary for a thorough development at deeper levels. I am told that an engine of 80 in. cylinder would be sufficient for sinking 100 fms. below the present bottom, which I believe is 130 fms. under the adit, which adit is about 40 fms. deep.

Pennance Mine, west of Tingtang, on the southern side of Carnmarth Hill, has the same adit as Tingtang—commonly called the "County Adit"—or a branch of it. Messrs. Williams and Co. worked this mine during a period of many (about 30) years, but the working consisted principally in the prosecution of that adit from Tingtang to Wheal Beauchamp boundary, where it is 70 fms. deep. The lode is large, and it is probable that copper would be found in abundance at deeper levels. The late trial was not what miners call "effectual." The pumping engine there did not, I believe, work more than a year or two. The lode is that of Wheal Beauchamp and Wheal Buller, where great riches were realised.

South-easterly from Wheal Buller is situated Penstruthal, having lodes nearly parallel therewith, now being worked for tin, but I am of opinion that copper will be found there at deeper levels. Old Penstruthal, at the south of the present workings, was a copper mine, and yielded a profit of 60 000*l.* in one year. Some people think that it would be well to re-work the old mine, but I would not advise such a step. Messrs. Little and Co. expended about 40,000*l.* since the successful company's abandonment, which is an unfavourable indication. However, it has been alleged that the last company did not sink much; if so it cannot be said that they made a fair trial of the mine. The money in that case was not well spent. A miner has just told me he thinks that copper would be found in abundance under the floor of mundic. Old Penstruthal is not a deep mine—120 fathoms under adit at Williams's shaft—but the engine-shaft was only 70 fathoms under adit. The miners have an old saying that "Mundic rides a good horse!"

West Penstruthal is the name given to that part of Penstruthal of which a company of Camborne men took a license to work after a prior license had been given to the Penstruthal Company. At an assize trial at Bodmin in 1832 it was determined to be the property of the Penstruthal Company.

East of, and contiguous to Penstruthal, is situated West Tresavean Mine—previously called the Bell—the land of Mr. J. J. Rogers, now being worked by a Welsh company, under the management of Capt. T. Parkyn—a successful man. At the adit, which is 40 fms. deep, the miners are operating on a tin lode of about 4 or 5 ft. in width, which

appears to be of good produce. But there are several copper lodes in the sett. The tin lode having been discovered by Capt. Parkyn, it was proposed at a meeting of agents and others, held at the Clinton Arms, Redruth, that the lode should be called Parkyn's lode. Further east and adjoining West Tresavean is Comford Mine, worked by Mr. Peter, of Redruth, where a lode of rich copper ore has recently been cut. Adjoining that mine is the celebrated Tresavean Mine, well known for its past yield of copper ore and great profits. Further east on the same lode is Treviskey Mine, formerly rich, and westward of Tresavean are Trethellan and Brewer, also formerly rich, but all now idle (except Tresavean, where a few men are at work at the adit level). Many have been the speculations as to the course of Tresavean lode eastward of Treviskey, and some attempts have been made to discover it; in particular the late Mr. B. Sampson, about 45 years ago, put an adit from the road between Comford and Gwennap Church southward to Devis, ¼ of a mile, but found nothing at all like that lode. My opinion is that it has no existence so far eastward as that. In Treviskey I had been told it is broken up. Soon after its entry into the clay-slate it failed in all respects; but it was rich all along through the granite. I understand that a company has been formed for working Tresavean side lodes—not the great lode, which has been extended to the 300 fm. level, where nothing has been left to warrant resumption. R. SYMONS.

City of Truro, May 2.

THE MONYDD GORDDU LEAD MINE.

SIR,—Some five years since I was induced to visit this mine by the report of a great course of ore having been cut there quite close to the surface, and certainly I never before or since have seen such a deposit so shallow. Returning a fortnight since, after a long absence abroad, I heard rumours of another important discovery having been made in the bottom level, and feeling an interest in seeing the result in depth of the first extraordinary indication of riches, I determined upon visiting the mine, where I was at once accorded permission to view by the very civil captain, who accompanied me underground. Here I saw a sight such as I (and probably but few mining men) ever saw the like of before. I have seen many courses of ore of greater proportions and richness, but never one of such an extraordinary character at the depth. In general appearance (excepting only the huge blocks of lead) it is much more like what is often met with near surface, and always known to indicate riches below; the whole effect was a very peculiar mixture of black and white, from the oxides of iron and copper, carbonates of lead and lime, with one of the finest gossans to be seen anywhere. When first cut into it was like a loosely packed bank of boulders of lead, but driving 2 or 3 fms. west the south lode (which has formed a junction with the north lode, some 8 fathoms above this level) is seen maintaining its true underlie, and full of ore, whilst the course of ore (running nearly due east and west) in the north, or what is called the Champion lode (but I query this being the case), has attained such a solidity, and is of such a strong appearance (being over 3 ft. wide, and having become firmly attached to the wall of the lode) that there is every certainty of a continuous course of ore here, but I am equally convinced that, good as this course of ore is, it will be found to be a mere nothing compared with what will be found when more settled ground be reached in the 36, which will be 47 fms. from surface; here I am convinced such a course of ore will be met with as will equal (if not surpass) anything yet found, even in this celebrated district, and I am glad, therefore, to see that active preparations are being made for sinking thereto as soon as possible.

Now, notwithstanding these assured riches on what is considered the Champion lode and the South lode (which, as previously mentioned, have formed a junction about 8 fms. above the 24, the cause, no doubt, of the lode being so broken up at this point), I am fully satisfied that a third lode further north will prove to be the backbone of the mine, and as it can be reached by a cross-cut from the 24 of only about 12 fms., which will give over 40 fms. of backs, this ought to be opened up at once. That good old miner, Capt. Matthew Francis, always said, "If you want to duplicate your finds of ore, seek parallel thereto, and I'll eat my words or my head if this northern lode does not cut as rich, or richer, than even the present big find." My advice to the proprietors of this magnificent property, summed up in a few words is, sink as rapidly as possible for the next level; drive with all dispatch to intersect the northern lode; also (which has hitherto been neglected) drive west on the course of the lodes, so as to overtake some of the big shoots of ore seen shallow, and which, in my opinion, all dip west, and Monydd Gorddu will speedily be in the front rank with the best mines in the Principality.

As to my theory respecting the northern lode turning out to be the real Champion lode I should like to hear the opinion of others well acquainted with the district, and as such an important discovery as this must do good more or less to all connected with the mining world, I hope that some of our leading mining men will take an interest in the subject, and give any information they can upon this run of lodes.

I met on this mine a very courteous gentleman, who told me that if encouraged by the present discovery holding on the proprietors proposed very shortly to pitch to sink a shaft 100 fms. deep in the very bottom of the valley, between the Monydd Gorddu and Court Grange Mines. This would be a grand undertaking, the expense of which should be shared equally by the latter, which would be equally benefited, and as 1000*l.* each should accomplish the work it would, after all, not be such a very onerous undertaking, while it would give the two mines such a depth as very few mines have attained in Cardiganshire. I feel positive that a magnificent and well-deserved success would reward the pluck of the adventurers, and they certainly have the good wishes of— CAPTAIN JACK.

Aberystwith, May 1.

OUR COMMERCIAL PROSPECTS.

SIR,—It is seldom that I trespass upon your valuable space, and I hope for your indulgence on this occasion. Very great uncertainty prevails as to the prospects of the metal markets, and, consequently, of the prospects of mining, in which so much capital is embarked, and probably dispersed among a greater number of holders than, at all events, proportionately in any other single undertaking. As your Journal is the accredited organ of the mining interest, and I have property embarked in mines, and for a great many years have dealt largely in shares of investment in mining properties, a letter from me in your columns may be *apropos* of the occasion. The outbreak of an Oriental war has very much affected prices in all our staple imports. Corn has risen considerably, especially wheat, as the Russian coasts of the Euxine and the Sea of Azoff may be said to be already blockaded by the Turkish navy, and if Hobart Pacha bombards Odessa he will do it thoroughly, and much corn will be destroyed. He will no doubt also follow the example set by England in the war against Russia by destroying the granaries in the Sea of Azof. Our mining investors and metal merchants argue from these premises, so far as they perceive their probability, that as bread becomes dear, and the amount of expenditure to procure it increases, the people will have less money for other purposes, and the prices of all metals must fall. This impression I find to be so general that it is not unimportant to call attention to some circumstances which read in a contrary direction. Let it be remembered, in the first instance, that if there were no war we should not obtain anything like the corn supply from Russia which we usually do, because the harvests in the Crimea, along the shores of the Sea of Azof, Bessarabia, Podolia, and Poland have been exceptionally bad. In the vicinity of the Gulfs of Bosnia and Finland, and along the country watered by the Neva, there were good but late harvests, and as they must send us corn from those ports in order to procure other articles in return, and the Turks will not hoist the flag of Mahommed over any mast in the Baltic, our commerce there cannot be affected by the war, either as to corn imports or metal exports. Besides, the quantity of grain stored in the world is very vast at present, and as we are only a few months away from the harvests of Western and Southern Europe and America, there will be no disposition to hold stores tenaciously, as the holders can get no such price anywhere else. Grain will pour in upon us from all parts, until Mark lane quotes lower prices than before the war began. It appears to me that from these considerations the apprehensions entertained as to cheaper metals because of dearer bread are groundless. Already there are symptoms of reaction in the price of wheat, which will hence steadily increase.

It is observed also that the value of nearly all descriptions of foreign and colonial produce has risen, and this furnishes an additional ground for the alarm that as this produce has become a necessity of the people they will expend upon it so much as to leave little to spare for the products of our mines. But, in fact, all the produce markets have not advanced, the tendency of tea is lower, rice is steady, dried fruits are rather cheaper, and the last excellent vintage has at least prevented an increase in the cost of wines. The rise that has taken place in the produce markets has not been the result of scarcity, but in sympathy with the rapid progress of dearer quotations in flour and wheat.

Moreover, it is not by the masses of our people that the home demand for metals is chiefly made. For workmen's tools and domestic utensils iron and steel are almost solely the requirements of the working classes, and it is pleasant to point out the fact that our iron exports for the first quarter of this year exceeded those for the first quarter of 1876, and that this increase has taken place in railway iron where the falling off had been most severely felt.

We are now approaching the building season, and never were such extensive creations of new buildings of all conceivable sorts contemplated. The "rookeries" of London are to a wonderful extent to be pulled down, new streets opened, with building areas on their skirts, and this work is going on throughout the United Kingdom; and in France and the United States new cities are contemplated, and older ones greatly extended. For all this work all sorts of metals will be wanting, from gold and silver coin to the iron for the shovel and the axe.

The shipping season has already opened. The Baltic is free; ice floes will not now endanger ships to British North America, New England, New York, and Philadelphia, and ships are consumers of all metals for cabin furniture, utensils, sheathing, bolts, chains, rivets, hoops, anchors, &c.

The war is more likely to increase the demand for metals than otherwise. Neither Russia nor Turkey produce the metallic articles they require to slay one another. Russia has good iron, and smelts it with charcoal, producing good steel, but not nearly sufficient for her peace requirements, far less for war. She has to create a navy, and will want every requisite from us. Yellow metal sheathing, copper caps, copper for cartridges, metal for shells, brass for cap plates, shoulder guards, sword belts; tin for canteens, drinking vessels, &c.; and steel for sabres, cutlasses, bayonets, rifle barrels, &c. Let it be remembered that there is 1,000,000 of men requiring all these things, and breaking, wearing, losing, and wasting them with all the prodigality of war. It is said in reply to this argument that America has sent the fire-arms wanted by both parties hitherto; so much the worse for Birmingham, but the Americans must get the materials from us, and our export of the superior metals thither is increasing from this very cause.

I will not refer to the present state of the English metal markets, which your readers all know; but I must say that at few periods within my memory has there been better opportunity for mining investment than now. The turning point in the price of metals generally has arrived. In consequence of recent depression shares in excellent prospective mines, and in some dividend paying mines, can be obtained at a price leaving a very broad margin for profit. This is the case particularly in lead mines. I will name none in this letter, but shall do so on a future occasion. I can, however, offer a competent opinion, and will afford advice to any intending investor who applies at my office. J. B. REYNOLDS,
Mining Share Dealer.

Ethelburga House, 71 and 72, Bishopsgate-street Within.

WEST GODOLPHIN.

SIR,—I have for some time carefully read the reports and particulars published respecting this mine, as I have great confidence that it will soon become one of the most profitable in the district; and I shall not be surprised if in a little time shares cannot be got for as many pounds per share as they are then selling tons of tin per month, which will soon be considerably more than they have yet sold in any one month. I am practically acquainted with all the mines in the district, and the great bodies of tin ore which have been met with about the present depth of this mine, considering the quantities of tin sold from the shallow workings, and the present extraordinary indications of great productiveness at the deepest point, I congratulate the fortunate proprietary. TRIBUTER.

Meetings of Public Companies.

FLAGSTAFF SILVER MINING COMPANY OF UTAH.

The sixth ordinary general meeting of proprietors was held at the City Terminus Hotel, Cannon-street, on Monday,

Mr. W. C. HARVEY in the chair.

Mr. A. A. de METZ (the secretary) having read the notice convening the meeting, the reports and accounts were taken as read.

The CHAIRMAN said this was practically the first annual meeting since the formation of the company that they held possession of their own property, and were able to have a voice in its management. The shareholders were doubtless aware that all the contracts made by the first board of directors each succeeding board had always considered fraudulent and void. The company had been virtually deprived of its property for some years past. No accounts whatever had been rendered since the end of 1874—the accounts which the shareholders at the meeting in the following June declined to adopt, and they were of such a character that he thought they could not possibly have been adopted until some further investigation had taken place. Without in any way prejudicing the rights of this company as against Mr. Davis, various attempts had been made from time to time to have some settlement of the matter with him without the expense of legal proceedings. The shareholders knew that Mr. Davis had on several occasions entered into an agreement to adopt one course or another, but when the critical moment arrived when these undertakings should have been fulfilled they were always repudiated by Mr. Davis. It then became necessary to consider (knowing from all quarters the value of the mine) whether they should rest under such treatment, or whether they should not by some bold and vigorous action on their part recover possession of their property, and by taking proceedings in America itself ejecting Messrs. Davis and Patrick from their illegal tenure of the mine. That policy (which ought to have been carried out by the previous board) had been followed by the present directors, and he thought the shareholders would agree with him in saying that that policy had proved eminently successful. (Applause.) When the proper time should arrive to give a description of the processes adopted—to tell, in fact, the story of their campaign—he was satisfied that the course which had been taken would meet with the approval of the shareholders; but it should be recollected that, to use a homely phrase of the late President Lincoln—"We must not attempt to swop horses whilst we are crossing the stream." (Hear, hear.) Therefore, knowing as they did that there were probably friends of Davis in the room, it was necessary to act with extreme caution in every step taken, and he hoped the shareholders would not press for any explanations on this matter. It was not a question of whether they should have the information or not, but of the proper time when that information should be given. He felt sure that when the directors were able to disburden themselves all their faults of omission or commission would be fully condoned by the shareholders. Another reason for caution was clearly explained in the report, which told the shareholders that Mr. Davis had commenced an action against the company in this country. The proceedings taken against Mr. Davis by the directors were taken in America—the place he conceived in which such proceedings should be taken—and Mr. Davis had been restrained by the American courts from in any way interfering with the agent or manager of the company or with the work at the mine. He (the Chairman) had before him the judgment of the Supreme Court of Appeal of Utah, which stated that Mr. Davis's contracts were *ultra vires* and fraudulent, and that Mr. Davis should be restrained from in any way interfering with the property of the Flagstaff Company. Mr. Davis had thought proper to appeal to the courts of law in this country, but how he imagined he was going to do anything in this country when the American courts had decided against him he could not tell. What sympathy would a man receive from an English court of justice who, on his own affidavit put before the court in Utah, stated that he and Patrick had declined to send any accounts whatever to this country, and in which he had admitted that large quantities of ore had been taken out of the mine without any account having been given of it, or as to what had been done with the ore when raised? A man who could act in that way, assuming that his contracts were valid, who had not made a report since 1874, although he had agreed to give monthly reports, could not expect much sympathy from a court of law in this country he imagined. (Hear, hear.) Under these circumstances he thought the shareholders would agree with the observation in the directors' report, which said there was nothing to fear from Mr. Davis in this country. (Applause.) He might go further, and say that Mr. Davis's own conduct showed evidence of dishonesty on his own and on Patrick's part, because the accounts sent in 1874, if he recollected rightly, showed he had turned out for that year 14,600 tons of ore, and yet for 1875 and 1876 they had no returns, but the mine had been placed in a large state of indebtedness. As against that, the accounts which the directors had now received from America showed that during the latter part of 1876 about 1200 tons of ore had been taken out of the mine every month, and continuous progress had been made since the company had been in possession of their property. These facts certainly went to show that enormous quantities of ore must have been taken out by these persons for which no account had been rendered up to the present day. (Hear, hear, and "Shame.") One affidavit stated an opinion (which he presumed could be substantiated) that upwards of two million dollars of ore had been abstracted from the mine by Davis and Patrick. He thought it would be unnecessary to go into further details as to the evidence which they had both against Davis and Patrick. (Hear, hear.) Suffice it to say that since the company had been in possession of their own mine it had been working in a very satisfactory manner. They had received accounts from the mine up to March 31. The accounts towards the end of March were not quite complete. Letters were expected that morning, but it seemed that one of the accounts was missing. He could, however, tell them that in January the ore raised was 1164 tons, in February 1800 tons, and in March (so far as they knew) 1049 tons. This latter comparatively low quantity was explained by the fact that March is usually one of the worst months in the year in America, in consequence of the melting and drifting of the snow, and a telegram had that morning been received in answer to an enquiry made by the directors as to the reasons for the low raise of ore in March, which stated that for 12 days in March the roads were impassable, and that would account, at all events in some way, for the low quantity of ore raised in March. In the first 18 days of April they had raised 1320 tons of ore, or upwards of 70 tons a day. With regard to what had been done with the ore, the quantity sold during January and February amounted to 2695 tons, and realised $61,860, that was part of the 4013 tons raised in three months. The number of tons sold during March they assumed would produce $40,220. Estimating it on the previous sales, it would make the total sales of produce in three months $102,080; against that there was, of course, the wages at the mine, expenditure, &c., $39,038: leaving a profit of $63,042. (Applause.) He thought he was correct in saying that the three first months in the year were the worst, and anybody acquainted with mining processes in Utah could correct him if he were wrong. Mr. Hunter, on taking possession of the property, stated that the mine was in splendid condition, and he believed that he would be able to realise $300,000 profit during the year. That was in the month of January, and the working of the first three months of the year showed his estimate to be very nearly correct, and he believed from what had been the result of the first 18 days of April that this estimate would be largely exceeded. (Hear, hear.) Now, it would be asked "What has been done with this money?" Mr. Davis left the company with a floating debt of $150,000; this was doubtless done advisedly, and was part of the conspiracy to keep the mine in debt. (Hear, hear.) If they said that they had made such profitable results in the first three months of working, it was clear that a floating debt should never have existed. (Hear, hear.) If they went no further they could see at once that Davis and Patrick had a distinct object in the course they pursued—to deprive the shareholders of their property, not by fair means, but certainly by foul. That floating debt was no doubt a great difficulty to deal with, for every undertaking must have working capital. The creditors were anxious to have payment of their money, and a large number of suits had been commenced against Mr. Hunter and the company to enforce payment. Most of the suits had been compromised or dealt with out there; but at the same time, money should be forthcoming to pay off this floating debt; and in one of Mr. Hunter's letters he had stated that if the floating debt was paid off the company would soon be in a position to resume dividends. He had a statement as to what had been done with the $63,000 to which he had referred, which showed that Mr. Hunter had paid for claims due by the company (of which he had sent a list) $43,600, and for machinery $1000, making $44,600, and leaving, with the 1200*l.* sent him from this country, about $24,000 as the balance. Since then no doubt further sums had been paid off the floating debt. He thought this statement showed that good and satisfying progress was being made, and that in the course of time, with healthy and careful management, they would commence to pay dividends. He should mention the matter of the South Star and Titus Mine. Several adverse claims of the blackmailing description had been allowed through the mismanagement of Mr. Patrick, whose duty it was in the two years he was in uncontrolled possession of the property to have stopped the litigation, instead of which he appeared rather to have promoted the blackmailing suits, that being no doubt part of the arrangement. One important claim was that of the South Star and Titus Mine, the owners of which claimed the Flagstaff vein. It was, therefore, absolutely essential to buy up this litigation. The owners claimed $1,000,000 from the Flagstaff Company. Their mine adjoined the south-east boundary of the Flagstaff, and whilst the litigation was pending the company could not work that part of their mine. That claim had now been bought up for $50,000, and the property had now been handed over to this company. Those who were able to judge stated that this purchase was one of the finest purchases the company could possibly make, and that it had increased enormously the value of their own property. It was very important that means for paying off this amount should immediately be found, and he hoped the shareholders would see that it was to their interest to assist the directors in so doing. Many rumours had been circulated, which was only natural, considering the duties they had undertaken, but he hoped the shareholders would not be led away by these rumours, but that they would have confidence in those who were managing their property—(Hear, hear.)—and that they would allow them to work out this matter to the end, leaving the board to investigate all matters. Very few of them knew the enormous amount of labour which had been attached to the direction of the company during the past 18 months, and the sacrifices which had been necessary, but he trusted that when the time should arrive for them to make the matter more clear the shareholders would support the directors in what they had done. He thought he need not make any observations on the accounts, but if there were any questions on them he would be very happy to answer them. The accounts were for two years and a quarter, the reason being that they had never been able to have an annual meeting at which the accounts could be passed. Many of the claims of creditors would run off by means of debentures or otherwise, but there was no immediate call—he thought he might say that—and that all matters would be easily arranged. Beyond that the company was in a very satisfactory condition. A telegram had been received from Mr Hunter that morning, to which he had referred, which stated:—"Roads impassable for 12 days in March. Mine working satisfactorily. Roads good now. Machinery working satisfactorily. Main shaft driven down 90 ft. further. Commence sixth level next week. Will continue sinking main shaft down for seventh level. Face of fifth level favourable indications. Another large ore body. Price of second-class ore advancing." That was very important, because at one time this so-called "iron ore" (of which there is an estimated quantity of 40,000 tons standing in the upper levels ready for taking down) was thrown away. Lately it had been selling at $15 per ton, or a net profit of 1*l.* 10*s.* per ton, and now the price was advancing. The telegram continued:—"Great competition for it. Ore body in fifth level going down towards sixth level. This is best ore in mine." With these observations he would move the adoption of the report and accounts. (Applause.)

Professor VINCENT seconded the motion.

Mr. ELLIOTT asked for a little further explanation as to the debt of $150,000. Did the 13,000*l.* also mentioned as indebtedness in Utah form part of that item?

The CHAIRMAN said it did. The 13,000*l.* was for various accounts which had been outstanding since 1874. As they were in the London books the directors had shown them in the accounts.

Mr ELLIOTT asked how it was that Mr. Davis had been able to involve the company in debts to the extent of $150,000 when his contract had been proved to be *ultra vires*? Should the claims not be struck out?—The CHAIRMAN, in reply, said it must be recollected that the debts were incurred by Patrick, who held a power of attorney for the company as manager of the company, although in his affidavit he declared himself to be a trustee of Davis. Mr. Hunter would, however, only pay those claims which after thorough investigation he found it absolutely necessary to pay. (Hear, hear.) If they were fair and legitimate creditors they could not refuse to pay them; at the same time, they were bringing an action against Mr. Davis to make him account for the ore taken out of the mine, and he would be surcharged with all these items.

Mr. ELLIOTT said, in asking his question, he had in his mind the observations of Judge Field, who has dealt with a similar case, and he would strongly advise that legal opinion should be taken on this point. He thought the contracts being invalid the company would not have to pay these claims. He had seen a parallel case, and he believed they could be disputed.

Mr. J. G. TAYLOR said he had positive information that Patrick made contracts with his own brother to cart ore for the company at $5 a ton when anybody else would have done it for $3.—The CHAIRMAN said that was stated in the evidence.

In reply to a Shareholder, the CHAIRMAN stated that, including the purchase of the South Star and Titus property, the total claims seemed to be $195,000, less 8,000*l.* due from the Last Chance Company and less $43,000 paid off in March.

Mr. STEIN asked how the directors proposed to deal with this indebtedness?

The CHAIRMAN replied that the proper way was, undoubtedly, to issue debentures and pay the claims, and they would try to get the debentures taken up. They wanted practically about 28,000*l.*, including the South Star and Titus claim. That money raised, they would immediately have remittances month by month from America to go towards paying off the interest, because 10 per cent. on 28,000*l.* would

not be much in a mine already producing at the rate of 500,000*l.* a-year. (Hear, hear.) Hitherto the debts had been paid off by Mr. Hunter out of the proceeds of the mine from time to time. They might, of course, yet recover something from Mr. Davis. The debenture indebtedness in London amounted to about 14,000*l.*

A SHAREHOLDER asked how much the old directors paid as a compromise?—The CHAIRMAN said 6000*l.*, and they agreed if required to provide 19,000*l.* more at 10 per cent. to assist the company; but they had not yet been asked to find this amount, as the time had not arrived.

Mr. SNELL asked if the $150,000 included the judgments brought up by Mr. Hunter, and whether those judgments would be the property of the company?

The CHAIRMAN replied in the affirmative to both questions.

Mr. BATTERS urged upon the meeting the desirability of furnishing funds so that the indebtedness of the company might be got rid of, and said they were all very thankful for what the directors had done on their behalf. (Hear, hear.) The shareholders should do all they could to strengthen the hands of the board.

The CHAIRMAN stated that he believed the debt of 14,000*l.* in London would be taken in debentures, and there was, therefore, 20,000*l.* more to be raised. This it was proposed to raise by means of debentures, repayable in three years, bearing 10 per cent. interest, and to issue them at the price of 90*l.* From the profits of the mine there would be ample to pay the interest, and to provide for the redemption of the debentures at the end of the three years, besides, he trusted, paying good dividends to the shareholders. There was no doubt as to the security for the debentures, and that the interest would be sent regularly.

After a further short conversation, the report and accounts were adopted unanimously.—Mr. Pearson, the retiring director, was unanimously elected with acclamation. Mr. A. Good was re-elected auditor.

The meeting closed with a vote of thanks to the Chairman and directors.

RIO TINTO COMPANY.

The fourth ordinary meeting of shareholders was held at the Cannon-street Hotel, on Thursday,

Mr. H. M. MATHESON in the chair.

Mr. R. J. FENNESSY (the secretary) read the notice calling the meeting; the report of the directors, which has already been published, was taken as read.

The CHAIRMAN said: The accounts which we have now put before you, gentlemen, have doubtless appeared to you to show a very large expenditure, and the figures are certainly large, but in point of fact they are not much in excess of those which were put before you at the beginning. The original cost of the mines was 3,850,000*l.*, and we then estimated the outlay necessary upon the railway, the pier, and the interest during construction (we under-estimated it no doubt) at 1,555,000*l.*, together 5,405,000*l.*, and I do not think we can be very much blamed if the amount both in regard to cost and in regard to the time taken has been somewhat exceeded in an enterprise of this gigantic nature. It has been so, but taking the extreme sum of the present accounts, omitting only from it the cash in hand and the other balances which are to the fore, 5,993,000*l.*, there is only an increase of 588,000*l.* Now, if we take the half of that as the interest on the additional time taken before produce begins, and the half of it upon additional works, we do not appear to be so very far out from the estimates taken at the very beginning of this enterprise. My task to-day is not an easy one, but I think I may rely upon your kind indulgence to listen patiently to the statements which I have to make, and I shall endeavour to make them as explicit as possible, and explain to you the present position and prospects of the undertaking. (Hear, hear.) If any one supposes that we have altered and that we can alter our view in regard to the future of this company they are very much mistaken; beyond the fact that the works for putting the company's property into a state to yield us the results which we reckoned upon have been more extensive, and have taken a longer time than we could have anticipated, there is nothing in these accounts which we consider at all exceptional. (Hear, hear.) Gentlemen, you will remember that in addition to a freehold property containing the valuable mines, in regard to the extent and value of which I need not say at this period another word—in addition to the freehold mines you possess a completed railway of 50 miles long to the seaport, fully equipped, and a pier. This last is constructed upon a scale which your directors considered desirable in the interests of the company—larger than what was absolutely required for our present mineral traffic, but designed to provide also for the increasing requirements of the trade of the port of Huelva, which is now the largest shipping port in the entire Peninsula; and if you ask me why we have concerned ourselves about the interests of the port of Huelva, I have merely to reply that it is essential for us to provide that there shall be a steady supply of shipping at a moderate scale of freight, and by doing what was in our power to promote the trade of the port, in imports as well as in exports, we did what we could to secure this result and to cheapen the homeward freight for our minerals, which is a very important factor in the good results we look for. (Hear, hear.) Now, we are well aware that the results of the working have not yet reached the point which we confidently expected they would have done when we met you last year, but I hope to show you not only that our greatest exertions, and those of the management in Spain, have been used to lay the foundation for a large and profitable business, but also that the position which has now been attained is such that you will yourselves be able to judge whether we are not warranted in anticipating that your expectations and ours will be realised. Before going into a few details, I may be permitted to refer for a moment to the deplorable condition of general trade; every industry in the country is more or less depressed—the coal trade, the iron trade, and I may say very specially the agricultural interest, probably to a greater extent than for many years past, has been depressed, and that is an interest on which the principal item of our produce very largely depends for its consumption; but I believe that we are entitled to derive comfort from that which may be a cause of present loss, and we may reasonably expect that the low price of pyrites, whilst it has been a necessity for the chemical trade, will hereafter lead to a wider consumption of those chemical products of which sulphuric acid forms the principal ingredient. The depression of the agricultural interest alone will necessitate the use of those stimulating manures, which, it is well known, are the best means of increasing the productiveness of the soil. I do not mean on this occasion to weary you with an explanation of the processes of working these mines; these have been fully given on former occasions, but a few details must be given you in order to put you in possession of the present state of the company's works. The uncovering of the mineral contained in that small portion of the vast deposits at Rio Tinto, which is now being quarried or worked by opencast, has made great progress, and the ore is being extracted from three different levels, and is now producing 15,000 tons of mineral per week, or at the rate of between 700,000 and 800,000 tons per year; that is the rate at which, for several weeks past, the mineral has been extracted. The extraction by mining underground was entirely discontinued last November, but it will probably be resumed to some extent should the board be advised to take that course by the consulting mining engineer, who is now on a special visit to Rio Tinto. Of this large quantity of ore 260,000, or 280,000 tons are to be sent forward during this present year for shipment, for delivery under contracts which have been actually entered into with buyers, and the remainder will be sent to the calcination ground to be treated for the production of copper on the spot. Now, these figures would, under what I may call normal conditions, yield us a very handsome result upon the capital expended upon this concern, large as it is; and they would go far to justify the rather sanguine expectation originally held out upon this head. There are several causes—I may state three causes—which at present have operated to modify the reasonable expectations which were then formed. The time taken to develope the works necessary for this large extraction has been greater than was foreseen, and I may say greater than could have been foreseen. It is since we met you last year that the direction in which those works had to be carried and extended has been more definitely decided upon than it had previously been. This has had the effect of accumulating interest against us, and consequently of increasing the amount of outlay upon which interest is payable. Then, a second reason is that the ore now being worked in the upper part of the opencast or quarry has not yielded us the copper contents upon which we were relying. The opinion of Mr. David Forbes, our late consulting engineer, was that the ore from the upper part of the lode might not prove of such quality as to be suitable for shipment, owing to probable oxidation; it was found, however, that the sulphur contents were more than sufficient to come up to the standard, and rather exceeded it, and, in order to lower as much as possible the expenses of the output, by saving the comparatively heavy cost of mining underground, we adopted the opencast system for all the mineral which was necessary to be produced. In doing so we relied upon the principle of selection, which is that in use in all the mines of a similar description to our own. We anticipated that by this system of selection so soon as the face of ore which was being worked was sufficiently extended we should obtain the copper contents necessary to give us the large profit on that part of the business which we expected, but, from whatever cause, the selection has not yet given us the copper contents that we looked for. A considerable improvement in this respect took place during the latter part of 1876, and we have put on foot measures, energetic measures, to provide better selection, and if it should be necessary we mean to return, to some extent, to mining underground, even at the difference of cost which is represented as about 5*s.* against less than 2*s.*, which it costs to quarry the mineral. There is not the slightest doubt, gentlemen, that this mine contains ores as rich in copper as those of the other similar mines which are well known, and which have been worked for a longer period by English capitalists. Careful surveys are also being made of the other lodes which have hitherto been untouched by us, and which are of very great extent, some of them virgin ore, and others of them already worked for many years by the Romans and others for copper alone. Then, there is another modifying circumstance, that although we allowed in our estimates a considerable deduction from the current price of sulpher at the time we began business a total reduction in the price of that article to the extent of 50 per cent. has taken place since that period, and such is the state of the chemical trade that I believe it is not expected that any great rally may be seen soon. Whilst, therefore, at the outset of the business it was intended principally to rely upon the export of pyrites, and only in a secondary way upon the production of copper upon the spot, this serious change in the condition of the market has forced upon us the question whether we should not take as the chief basis of the business the production of copper; whilst, at the same time, continuing to send forward for shipment the best ore suitable for the market. We find from experience that the low price at which the ore can be extracted, and the moderate cost at which copper can be produced by the cementation process, amply justify this change in our views for the future working of the business. We found in practice that the lowest price of copper ruling, or likely to rule, in this market would leave a large margin of profit for the company, and as the quantity of ore applicable to this manufacture is exceedingly large all that was necessary was to provide on a sufficiently large scale, and with the utmost amount of convenience, for economy of working, the means of transporting the mineral upon the ground, and of calcining and washing it, and precipitating the copper. But there is a peculiar feature of this method of dealing with our mineral which forced itself upon our attention, and which had much influence in inducing us to make the change of plan which I have just indicated. After the ore has been calcined about 1 per cent. of the copper contents of that ore becomes immediately soluble, and is at once extracted from the burnt mineral by the water applied to it in the tanks; the remainder of the copper, consisting generally of about an equal quantity—say, 1 per cent. or a little more—remains in the waste, and becomes available gradually by exposure to the air, and by the application of water during a period of from five to six, and even a longer period of years. The part of the produce which is thus obtainable is the more valuable because it has very little expense to meet. For example, supposing that 400,000 tons of mineral are burnt in one year. This quantity would yield us by the washing and cementation tanks 4000 tons of metallic copper, but an equal quantity of about 4000 tons of metallic copper remain in what are called "waste heaps," to be obtained gradually—say, in five or six years, or even more—by applying water to these heaps. We have in operation on the waste heaps at Rio Tinto two large steam-pumps, which are constantly employed in pumping water upon them, so that copper water may be produced to be used in the cementation tanks. From this it is evident that this last 4000 tons of copper that remains in the waste heaps form a sound, large reserve for the company, which as we go on with calcination will increase; or, to put it in other words, it materially reduces the price at which we produce the copper on the spot. I have entered into these details of the company's trade somewhat reluctantly, but I have done it because I feel that you are entitled to receive from us the fullest explanations of the increased outlay that has been incurred during the past year. A large new system of tanks, both for washing and precipitating, has been constructed. The first portion of these new tanks is just about to come into operation. Then a large reservoir has been most successfully completed, containing a very large supply of water, now full; and that, along with the other means which we had already provided, it is calculated, will be amply sufficient for all the purposes of the cementation works on the largest scale. Railway lines have been constructed all through the calcining grounds, which have been very much extended. Engines and other stock had to be provided. It is only since May last that the ore for calcination began to be erected in telaras and burned, and as these telaras take at least six months to burn, a very small portion of the copper we produced and sold in the market last year came from that source. It was chiefly derived from the drainage of the mine, and from the water thrown on the old heaps to which I have already referred. I might here say that we have taken no credit in the accounts of the company for these old heaps. They were left upon the ground by the Spanish Government. They made us pay for the telaras or calcined heaps of ore unwashed that they handed over to us, but the immense masses of waste heaps were not put, into the inventory that was paid for by the company. They contain a large amount of copper, and by the process which I have explained are made to yield copper so as to assist considerably the production of that valuable metal. Now, after all these things have been said, and have been weighed at their proper value, you will no doubt ask me—"What about the future; what are we to expect for all our outlay, and how soon may we begin to receive some return?" This year—during 1877—for the first quarter the copper manufactured on the spot has reached the amount of 600 tons of metallic copper. That has been done without any of the increased tank accommodation to which I have already referred—just with the old means of production—and we estimate on a very moderate calculation that there will be produced during the year 4000 or 4200 tons of metallic copper. (Applause.) I have already referred to the export of pyrites under contract—260,000 or 280,000 tons. From these principal sources of income, and from other subordinate ones, I have no hesitation myself in saying that I entertain a strong hope that we shall have something over after discharging all claims for interest on bonds and on borrowed money, and all expenses. The interest and expenses will certainly be met. (Applause.) How much will remain I cannot venture to say, and I hardly think you can ask me to do so. (Hear, hear.) But this I may say for my colleagues and myself—that there will be a desire on our part to communicate to you at an intermediate period how matters are progressing. Our estimates, however, necessarily extend beyond the year 1877, and I may with perfect safety assure you that with the most ordinary fortune from the contracts already made, and the means of copper production which will then be in more extended operation, we may confidently anticipate such results for 1878 as will go far to reassure the most timid of our shareholders. I will only add, that as in the past, my own most constant and strenuous exertions, as well as those of my colleagues, will continue to be made in order to forward your interests. Those interests are very large, and, as you are doubtless aware, we are ourselves very largely concerned with you, and have no interests that are different from your own. I have some delicacy in saying it, but those immediately connected with myself have given abundant proof of their confidence in the success of this undertaking by the strong support which they have given to it. I trust I have made plain the various points which have been touched upon, and it will be my desire to satisfy, as far as it may be proper in your interests, every shareholder now present, and to answer all the questions that any of you may wish to put to me in connection with the business. We are here, of course, fully informed about the business, but as traders it may not be prudent to answer everything that anyone may ask; at the same time I shall do my very utmost to satisfy any shareholder that has any scruples or difficulties that he wishes to be explained. I conclude by moving—"That the report and accounts now presented be received and adopted."

Mr. WILLIAM MACANDREW (the deputy-Chairman): I beg leave to second that motion.

The CHAIRMAN: I may just say that before we close the meeting the proposal must be made again that the auditors be re-appointed. It is necessary at each meeting that auditors should be freshly appointed, and a motion will have to be submitted to that effect.

Mr. POWELL said many of the shareholders would, he thought, like to see a revenue account for the year, and that it should be continued yearly, in order that the full details of the expenditure for the year might be given, so that the shareholders could compare them with the preceding year. With respect to the observation made by the Chairman as to the increased cost, he held in his hand a copy of the original prospectus, in which the estimated cost was put at 2,700,000*l.* Now, the actual cost had reached within a trifling amount of 6,000,000*l.*

The CHAIRMAN: But you have only taken three years payment out of the ten annual payments to the Spanish Government. That 2,700,000*l.* is all we estimated in making that statement.

Mr. POWELL: I see that that is so. I will confine my observations to the first remark then.

Mr. HAMILTON remarked that he understood the Chairman to say that the present figures go far to justify the anticipations originally held out. Now, he had expected something like 10 per cent. for the original shareholders, and he would ask whether the Chairman could give the shareholders any idea when it is likely that the original shareholders would get anything like a decent dividend from the mine?

The CHAIRMAN: In reply to Mr. Powell, we should have been very glad, and we had some hopes, and I said so last year, of presenting a profit and loss account for the working of the year 1876. I have, however, been obliged to confess that the preparation of the work has taken longer—very considerably longer—than any of us anticipated, and that it would have been a mixed account, a very large portion of it was for capital, and a very moderate proportion would be put against the real income and results, and that, therefore, acting under the advice of Messrs. Turquand, Youngs, and Company, we abandoned the idea of attempting a profit and loss account absolutely for last year, and determined to throw everything into capital down to a period from which to begin absolutely the new system, and certainly without any question of whether we make a loss or a profit, it may be relied upon that a revenue account will be presented. There must be some further expenditure on capital—I know there is, because the tanks and lines of rail to which I have referred are not quite completed, and there will be some slight addition in that item, but we shall present a revenue account for the current 12 months. In regard to Mr. Hamilton's observation, what I said was that under normal conditions the figures which I gave to you as the output of the mineral and so on would have yielded us something like the results we had led you to expect, but the enormous depreciation in the price of sulphur, and the price of copper also probably lower than the average, decidedly it is so—make it impossible for us to dream of the results for that output that we then said were likely. At the same time we can very largely extend the output from what was then contemplated, and I am in hopes by a larger production of copper that we shall get what Mr. Hamilton would consider a satisfactory result. I believe there will be a result to satisfy Mr. Hamilton and the rest of the shareholders.

Mr. POWELL: May I ask what was the loss by the bullion robbery to the company, and if steps have been taken against a repetition of such an event?—The CHAIRMAN: I am very sorry to say that the loss by the bullion robbery was a very considerable one—8200*l.* is about the amount that was stolen from the diligence on that occasion. We have made an amicable arrangement with the agents of the company to divide the loss between them and us. It was impossible to fix absolutely the liability for that loss, and the directors felt it was desirable that we should make some settlement. After considerable delay that is the settlement we have lately made in connection with it, but the utmost possible care will in future be taken. Any bullion which has been transmitted from one place to another has ever since been accompanied by *guardias civiles*, and every means by intimation to the authorities of the transit of the bullion has been taken to prevent a mishap, but for the most part we have got the bullion required from Huelva without having to go beyond that for it.

Mr. MEISSNER: Will the expenses be about the same next year as they have been during the past four years?—The CHAIRMAN: There is a very large staff, and I can only assure the meeting that every effort will be made to economise as far as possible. We cannot employ inferior labour, but economy is being studied to the utmost of our power.

A SHAREHOLDER: There are two items in the accounts—"Profits on sales of produce, 157,539*l.*;" and "Produce shipped and remaining on hand in Great Britain and elsewhere, as per inventories, 66,253*l.*" Do I understand that that is the whole produce up to the present time? Together about 220,000*l.*—The CHAIRMAN: Substantially it is so. They have been subjected before coming to these figures to every possible deduction. They do not fairly represent all the produce we have had. Nothing in existence on the mines in process of working has been taken into account in these figures, but will be found under another item.

The report and accounts were then unanimously adopted.

Mr. SKINNER: Now, Sir, I beg to propose that Messrs. Turquand, Youngs and Co., be re-elected auditors of the company for the current year. Their names are so well known to all here that I am sure they do not require any recommendation from me.

Mr. SURGEY seconded the motion, which was carried.

Mr. HAMILTON proposed with great pleasure a vote of thanks to the Chairman and directors for the manner in which the business had been conducted. Whatever might be the position of the company they all knew that it was in thoroughly good hands, and that everything possible will be done to make it successful.

Mr ANDERSON seconded the motion, which was carried with acclamation.

The CHAIRMAN: I am very much obliged to you indeed, on the part of my colleagues and myself, for the very kind confidence which you have been pleased to express through Mr. Hamilton and by this vote. You may rest assured nothing will be wanting on our part to carry forward this great enterprise to a success which I have every reason to expect will be satisfactory to you ere long.

The proceedings then terminated.

SANTA BARBARA GOLD MINING COMPANY.

The sixth annual general meeting of shareholders was held on Monday at the office of the company, Cook-street, Liverpool,

Mr. P. S. HOLLAND in the chair.

The SECRETARY read the notice convening the meeting and the minutes of the last meeting. The report and statement of accounts were taken as read.

The CHAIRMAN then said that the report gave such full information that he would make but few remarks on it; the progress of the company the shareholders would perceive was steady, and some 2000 tons of mineral had been stamped in the past year in excess of the quantity treated in 1875; this increased output, together with the additional yield per ton of stone, as compared with the same year of about 2*s.* per ton, accounted for the increased value of the gold obtained amounting to some 4000*l.*, roughly speaking, above the produce of 1875, while the expenses not showing an increase of much over 1000*l.*, the results accordingly show a gain of 3000*l.* in profits over the year 1875. The prospects for 1877, although the operations at the mine have been much interfered with by the unfortunate floods experienced in February, are encouraging, for there is little doubt, I think, that later on in the year more force can be put to extract mineral from the stopes below the adit, where the lode has a very promising appearance; and apart from any increase in the produce per ton, every additional 100 tons of ore raised in the month will make a great difference in the profits by reason of the expenses showing but a small relative increase, and now that we are so amply provided with stamping power we could show much better results if we can raise 1500 tons of good mineral per month. Respecting the damage done to our water-courses owing to the floods, the board are not informed what outlay will be necessary to put matters to rights, but they believe it will be inconsiderable. The directors propose in the report to carry forward a considerable sum, besides adding to the reserve, and this they have been mainly induced to recommend, in order that the position of the company may be strengthened as regards this year's dividends, as our desire is to maintain a steady dividend if possible, and this is, doubtless, your view as well. The new seurfala, or houses for blacks, has been completed during the year, and will I hope enable Mr. Hilcke to increase the number of our labourers. I trust the outlay on capital account has now nearly come to an end, this being an account that I should like to see closed as far as practicable at an early date, but at the same time the works that have been debited to capital are all necessary for the proper advantageous working of the mine, to which such outlays are indispensable if it is to be developed advantageously. But a small amount will be required for the purchase of the outlying properties alluded to in the report, and the acquisition of these will, no doubt, be of great advantage to the company. I do not think that there is anything further that I can say to interest you, the report, as I before said, being intended to give you the fullest information. I beg now to move, "That the report of the directors, with statement of accounts for the year ending Dec. 31, 1876, be received and adopted, and that a dividend of 1*s.* 3*d.* per share be declared, making with interim dividend paid a total of 2*s.* 6*d.* per share on the year."

Mr. A. PIGGOTT FLETCHER seconded the motion, remarking that he thought the position of their property had been clearly laid before the shareholders.

After a discussion in which several shareholders expressed their satisfaction with the plan issued with the report, enabling them to understand the workings of the mine better than heretofore, and also their confidence in the management, the CHAIRMAN put the resolution for the adoption of the report and accounts, and the payment of a dividend of 1*s.* 3*d.* per share on May 19, which were carried unanimously.—Resolutions were then passed unanimously re-electing Mr. A. Piggott Fletcher a director of the company, and Mr. A. W. Chalmers as auditor.

appears to be of good produce. But there are several copper lodes in the sett. The tin lode having been discovered by Capt. Parkyn, it was proposed at a meeting of agents and others, held at the Clinton Arms, Redruth, that the lode should be called Parkyn's lode. Further east and adjoining West Tresavean is Comford Mine, worked by Mr. Peter, of Redruth, where a lode of rich copper ore has recently been cut. Adjoining that mine is the celebrated Tresavean Mine, well known for its past yield of copper ore and great profits. Further east on the same lode is Treviskey Mine, formerly rich, and westward of Tresavean are Trethellan and Brewer, also formerly rich, but all now idle (except Tresavean, where a few men are at work at the adit level). Many have been the speculations as to the course of Tresavean lode eastward of Treviskey, and some attempts have been made to discover it; in particular the late Mr. B. Sampson, about 45 years ago, put an adit from the road between Comford and Gwennap Church southward to Devis, ½ of a mile, but found nothing at all like that lode. My opinion is that it has no existence so far eastward as that. In Treviskey I had been told it is broken up. Soon after its entry into the clay-slate it failed in all respects; but it was rich all along through the granite. I understand that a company has been formed for working Tresavean side lodes—not the great lode, which has been extended to the 300 fm. level, where nothing has been left to warrant resumption. R. SYMONS.

City of Truro, May 2.

THE MONYDD GORDDU LEAD MINE.

SIR,—Some five years since I was induced to visit this mine by the report of a great course of ore having been cut there quite close to the surface, and certainly I never before or since have seen such a deposit so shallow. Returning a fortnight since, after a long absence abroad, I heard rumours of another important discovery having been made in the bottom level, and feeling an interest in seeing the result in depth of the first extraordinary indication of riches, I determined upon visiting the mine, where I was at once accorded permission to view by the very civil captain, who accompanied me underground. Here I saw a sight such as I (and probably but few mining men) ever saw the like of before. I have seen many courses of ore of greater proportions and richness, but never one of such an extraordinary character at the depth. In general appearance (excepting only the huge blocks of lead) it is much more like what is often met with near surface, and always known to indicate riches below; the whole effect was a very peculiar mixture of black and white, from the oxides of iron and copper, carbonates of lead and lime, with one of the finest go-saus to be seen anywhere. When first cut into it was like a loosely packed bank of boulders of lead, but driving 2 or 3 fms. west the south lode (which has formed a junction with the north lode, some 8 fathoms above this level) is seen maintaining its true underlie, and full of ore, whilst the course of ore (running nearly due east and west) in the north, or what is called the Champion lode (but I query this being the case), has attained such a solidity, and is of such a strong appearance (being over 3 ft. wide, and having become firmly attached to the wall of the lode) that there is every certainty of a continuous course of ore here, but I am equally convinced that, good as this course of ore is, it will be found to be a mere nothing compared with what will be found when more settled ground be reached in the 36, which will be 47 fms. from surface; here I am convinced such a course of ore will be met with as will equal (if not surpass) anything yet found, even in this celebrated district, and I am glad, therefore, to see that active preparations are being made for sinking thereto as soon as possible.

Now, notwithstanding these assured riches on what is considered the Champion lode and the South lode (which, as previously mentioned, have formed a junction about 8 fms. above the 24, the cause, no doubt, of the lode being so broken up at this point), I am fully satisfied that a third lode further north will prove to be the backbone of the mine, and as it can be reached by a cross-cut from the 24 of only about 12 fms., which will give over 40 fms. of backs, this ought to be opened up at once. That good old miner, Capt. Matthew Francis, always said, "If you want to duplicate your finds of ore, seek parallel thereto, and I'll eat my words or my head if this northern lode does not cut as rich, or richer, than even the present big find." My advice to the proprietors of this magnificent property, summed up in a few words is, sink as rapidly as possible for the next level; drive with all dispatch to intersect the northern lode; also (which has hitherto been neglected) drive west on the course of the lodes, so as to overtake some of the big shoots of ore seen shallow, and which, in my opinion, all dip west, and Monydd Gorddu will speedily be in the front rank with the best mines in the Principality.

As to my theory respecting the northern lode turning out to be the real Champion lode I should like to hear the opinion of others well acquainted with the district, and as such an important discovery as this must do good more or less to all connected with the mining world, I hope that some of our leading mining men will take an interest in the subject, and give any information they can upon this run of lodes.

I met on this mine a very courteous gentleman, who told me that if encouraged by the present discovery holding on the proprietors proposed very shortly to pitch to sink a shaft 100 fms. deep in the very bottom of the valley, between the Monydd Gorddu and Court Grange Mines. This would be a grand undertaking, the expense of which should be shared equally by the latter, which would be equally benefited, and as 1000*l.* each should accomplish the work it would, after all, not be such a very onerous undertaking, while it would give the two mines such a depth as very few mines have attained in Cardiganshire. I feel positive that a magnificent and well-deserved success would reward the pluck of the adventurers, and they certainly have the good wishes of— CAPTAIN JACK.

Aberystwith, May 1.

OUR COMMERCIAL PROSPECTS.

SIR,—It is seldom that I trespass upon your valuable space, and I hope for your indulgence on this occasion. Very great uncertainty prevails as to the prospects of the metal markets, and, consequently, of the prospects of mining, in which so much capital is embarked, and probably dispersed among a greater number of holders than, at all events, proportionately in any other single undertaking. As your Journal is the accredited organ of the mining interest, and I have property embarked in mines, and for a great many years have dealt largely in shares of investment in mining properties, a letter from me in your columns may be *apropos* of the occasion. The outbreak of an Oriental war has very much affected prices in all our staple imports. Corn has risen considerably, especially wheat, as the Russian coasts of the Euxine and the Sea of Azoff may be said to be already blockaded by the Turkish navy, and if Hobart Pacha bombards Odessa he will do it thoroughly, and much corn will be destroyed. He will no doubt also follow the example set by England in the war against Russia by destroying the granaries in the Sea of Azof. Our mining investors and metal merchants argue from these premises, so far as they perceive their probability, that as bread becomes dear, and the amount of expenditure to procure it increases, the people will have less money for other purposes, and the prices of all metals must fall. This impression I find to be so general that it is not unimportant to call attention to some circumstances which read in a contrary direction. Let it be remembered, in the first instance, that if there were no war we should not obtain anything like the corn supply from Russia which we usually do, because the harvests in the Crimea, along the shores of the Sea of Azof, Bessarabia, Podolia, and Poland have been exceptionally bad. In the vicinity of the Gulfs of Bosnia and Finland, and along the country watered by the Neva, there were good but late harvests, and as they must send us corn from those ports in order to procure other articles in return, and the Turks will not hoist the flag of Mahommed over any mast in the Baltic, our commerce there cannot be affected by the war, either as to corn imports or metal exports. Besides, the quantity of grain stored in the world is very vast at present, and as we are only a few months away from the harvests of Western and Southern Europe and America, there will be no disposition to hold stores tenaciously, as the holders can get no such price anywhere else. Grain will pour in upon us from all parts, until Mark lane quotes lower prices than before the war began. It appears to me that from these considerations the apprehensions entertained as to cheaper metals because of dearer bread are groundless. Already there are symptoms of reaction in the price of wheat, which will hence steadily increase.

It is observed also that the value of nearly all descriptions of foreign and colonial produce has risen, and this furnishes an additional ground for the alarm that as this produce has become a necessity of the people they will expend upon it so much as to leave little to spare for the products of our mines. But, in fact, all the produce markets have not advanced, the tendency of tea is lower, rice is steady, dried fruits are rather cheaper, and the last excellent vintage has at least prevented an increase in the cost of wines. The rise that has taken place in the produce markets has not been the result of scarcity, but in sympathy with the rapid progress of dearer quotations in flour and wheat.

Moreover, it is not by the masses of our people that the home demand for metals is chiefly made. For workmen's tools and domestic utensils iron and steel are almost solely the requirements of the working classes, and it is pleasant to point out the fact that our iron exports for the first quarter of this year exceeded those for the first quarter of 1876, and that this increase has taken place in railway iron where the falling off had been most severely felt.

We are now approaching the building season, and never were such extensive creations of new buildings of all conceivable sorts contemplated. The "rookeries" of London are to a wonderful extent to be pulled down, new streets opened, with building areas on their skirts, and this work is going on throughout the United Kingdom; and in France and the United States new cities are contemplated, and older ones greatly extended. For all this work all sorts of metals will be wanting, from gold and silver coin to the iron for the shovel and the axe.

The shipping season has already opened. The Baltic is free; ice floes will not now endanger ships to British North America, New England, New York, and Philadelphia, and ships are consumers of all metals for cabin furniture, utensils, sheathing, bolts, chains, rivets, hoops, anchors, &c.

The war is more likely to increase the demand for metals than otherwise. Neither Russia nor Turkey produce the metallic articles they require to slay one another. Russia has good iron, and smelts it with charcoal, producing good steel, but not nearly sufficient for her peace requirements, far less for war. She has to create a navy, and will want every requisite from us. Yellow metal sheathing, copper caps, copper for cartridges, metal for shells, brass for cap plates, shoulder guards, sword belts; tin for canteens, drinking vessels, &c.; and steel for sabres, cutlasses, bayonets, rifle barrels, &c. Let it be remembered that there is 1,000,000 of men requiring all these things, and breaking, wearing, losing, and wasting them with all the prodigality of war. It is said in reply to this argument that America has sent the fire-arms wanted by both parties hitherto; so much the worse for Birmingham, but the Americans must get the materials from us, and our export of the superior metals thither is increasing from this very cause.

I will not refer to the present state of the English metal markets, which your readers all know; but I must say that at few periods within my memory has there been better opportunity for mining investment than now. The turning point in the price of metals generally has arrived. In consequence of recent depression shares in excellent prospective mines, and in some dividend-paying mines, can be obtained at a price leaving a very broad margin for profit. This is the case particularly in lead mines. I will name none in this letter, but shall do so on a future occasion. I can, however, offer a competent opinion, and will afford advice to any intending investor who applies at my office. J. B. REYNOLDS, Mining Share Dealer.

Ethelburga House, 71 and 72, Bishopsgate-street Within.

WEST GODOLPHIN.

SIR,—I have for some time carefully read the reports and particulars published respecting this mine, as I have great confidence that it will soon become one of the most profitable in the district; and I shall not be surprised if in a little time shares cannot be got for as many pounds per share as they are then selling tons of tin per month, which will soon be considerably more than they have yet sold in any one month. I am practically acquainted with all the mines in the district, and the great bodies of tin ore which have been met with about the present depth of this mine, considering the quantities of tin sold from the shallow workings, and the present extraordinary indications of great productiveness at the deepest point, I congratulate the fortunate proprietary. TRIBUTER.

Meetings of Public Companies.

FLAGSTAFF SILVER MINING COMPANY OF UTAH.

The sixth ordinary general meeting of proprietors was held at the City Terminus Hotel, Cannon-street, on Monday,

Mr. W. C. HARVEY in the chair.

Mr. A. A. de METZ (the secretary) having read the notice convening the meeting, the reports and accounts were taken as read.

The CHAIRMAN said this was practically the first annual meeting since the formation of the company that they held possession of their own property, and were able to have a voice in its management. The shareholders were doubtless aware that all the contracts made by the first board of directors each succeeding board had always considered fraudulent and void. The company had been virtually deprived of its property for some years past. No accounts whatever had been rendered since the end of 1874—the accounts which the shareholders at the meeting in the following June declined to adopt, and they were of such a character that he thought they could not possibly have been adopted until some further investigation had taken place. Without in any way prejudicing the rights of this company as against Mr. Davis, various attempts had been made from time to time to have some settlement of the matter with him without the expense of legal proceedings. The shareholders knew that Mr. Davis had on several occasions entered into an agreement to adopt one course or another, but when the critical moment arrived when these undertakings should have been fulfilled they were always repudiated by Mr. Davis. It then became necessary to consider (knowing from all quarters the value of the mine) whether they should rest under such treatment, or whether they should not by some bold and vigorous action on their part recover possession of their property, and by taking proceedings in America itself ejecting Messrs. Davis and Patrick from their illegal tenure of the mine. That policy (which ought to have been carried out by the previous board) had been followed by the present directors, and he thought the shareholders would agree with him in saying that that policy had proved eminently successful. (Applause.) When the proper time should arrive to give a description of the processes adopted—to tell, in fact, the story of their campaign—he was satisfied that the course which had been taken would meet with the approval of the shareholders; but it should be recollected that, to use a homely phrase of the late President Lincoln—"We must not attempt to swop horses whilst we are crossing the stream." (Hear, hear.) Therefore, knowing as they did that there were probably friends of Davis in the room, it was necessary to act with extreme caution in every step taken, and he hoped the shareholders would not press for any explanations on this matter. It was not a question of whether they should have the information or not, but of the proper time when that information should be given. He felt sure that when the directors were able to disburden themselves all their faults of omission or commission would be fully condoned by the shareholders. Another reason for caution was clearly explained in the report, which told the shareholders that Mr. Davis had commenced an action against the company in this country. The proceedings taken against Mr. Davis by the directors were taken in America—the place he conceived in which such proceedings should be taken—and Mr. Davis had been restrained by the American courts from in any way interfering with the agent or manager of the company or with the work at the mine. He (the Chairman) had before him the judgment of the Supreme Court of Appeal of Utah, which stated that Mr. Davis's contracts were *ultra vires* and fraudulent, and that Mr. Davis should be restrained from in any way interfering with the property of the Flagstaff Company. Mr. Davis had thought proper to appeal to the courts of law in this country, but how he imagined he was going to do anything in this country when the American courts had decided against him he could not tell. What sympathy would a man receive from an English court of justice who, on his own affidavit put before the court in Utah, stated that he and Patrick had declined to send any accounts whatever to this country, and in which he had admitted that large quantities of ore had been taken out of the mine without any account having been given of it, or as to what had been done with the ore when raised? A man who could act in that way, assuming that his contracts were valid, who had not made a report since 1874, although he had agreed to give monthly reports, could not expect much sympathy from a court of law in this country he imagined. (Hear, hear.) Under these circumstances he thought the shareholders would agree with the observation in the directors' report, which said there was nothing to fear from Mr. Davis in this country. (Applause.) He might go further, and say that Mr. Davis's own conduct showed evidence of dishonesty on his own and on Patrick's part, because the accounts sent in 1874, if he recollected rightly, showed he had turned out for that year 14,600 tons of ore, and yet for 1875 and 1876 they had no returns, but the mine had been placed in a large state of indebtedness. As against that, the accounts which the directors had now received from America showed that during the latter part of 1876 about 1200 tons of ore had been taken out of the mine every month, and continuous progress had been made since the company had been in possession of their property. These facts certainly went to show that enormous quantities of ore must have been taken out by these persons for which no account had been rendered up to the present day. (Hear, hear, and "Shame.") One affidavit stated an opinion (which he presumed could be substantiated) that upwards of two million dollars of ore had been abstracted from the mine by Davis and Patrick. He thought it would be unnecessary to go into further details as to the evidence which they had both against Davis and Patrick. (Hear, hear.) Suffice it to say that since the company had been in possession of their own mine it had been working in a very satisfactory manner. They had received accounts from the mine up to March 31. The accounts towards the end of March were not quite complete. Letters were expected that morning, but it seemed that one of the accounts was missing. He could, however, tell them that in January the ore raised was 1164 tons, in February 1800 tons, and in March (so far as they knew) 1049 tons. This latter comparatively low quantity was explained by the fact that March is usually one of the worst months in the year in America, in consequence of the melting and drifting of the snow, and a telegram had that morning been received in answer to an enquiry made by the directors as to the reasons for the low raise of ore in March, which stated that for 12 days in March the roads were impassable, and that would account, at all events in some way, for the low quantity of ore raised in March. In the first 18 days of April they had raised 1320 tons of ore, or upwards of 70 tons a day. With regard to what had been done with the ore, the quantity sold during January and February amounted to 2695 tons, and realised $61,860, that was part of the 4013 tons raised in three months. The number of tons sold during March they assumed would produce $40,220. Estimating it on the previous sales, it would make the total sales of produce in three months $102,080; against that there was, of course, the wages at the mine, expenditure, &c., $39,038: leaving a profit of $63,042. (Applause.) He thought he was correct in saying that the three first months in the year were the worst, and anybody acquainted with mining processes in Utah could correct him if he were wrong. Mr. Hunter, soon after taking possession of the property, stated that the mine was in splendid condition, and he believed that he would be able to realise $300,000 profit during the year. That was in the month of January, and the working of the first three months of the year showed his estimate to be very nearly correct, and he believed from what had been the result of the first 18 days of April that this estimate would be largely exceeded. (Hear, hear.) Now, it would be asked "What has been done with this money?" Mr. Davis left the company with a floating debt of $150,000; this was doubtless done advisedly, and was part of the conspiracy to keep the mine in debt. (Hear, hear.) If they said that they had made such profitable results in the first three months of working, it was clear that a floating debt should never have existed. (Hear, hear.) If they went no further they could see at once that Davis and Patrick had a distinct object in the course they pursued—to deprive the shareholders of their property, not by fair means, but certainly by foul. That floating debt was no doubt a great difficulty to deal with, for every undertaking must have working capital. The creditors were anxious to have payment of their money, and a large number of suits had been commenced against Mr. Hunter and the company to enforce payment. Most of the suits had been compromised or dealt with out there; but at the same time, money should be forthcoming to pay off this floating debt; and in one of Mr. Hunter's letters he had stated that if the floating debt was paid off the company would soon be in a position to resume dividends. He had a statement as to what had been done with the $63,000 to which he had referred, which showed that Mr. Hunter had paid for claims due by the company (of which he had sent a list) $43,600, and for machinery $1000, making $44,600, and leaving, with the 1200*l.* sent him from this country, about $24,000 as the balance. Since then no doubt further sums had been paid off the floating debt. He thought this statement showed that good and satisfying progress was being made, and that in the course of time, with healthy and careful management, they would commence to pay dividends. He should mention the matter of the South Star and Titus Mine. Several adverse claims of the blackmailing description had been allowed through the mismanagement of Mr. Patrick, whose duty it was in the two years he was in uncontrolled possession of the property to have stopped the litigation, instead of which he appeared rather to have promoted the blackmailing suits, that being no doubt part of the arrangement. One important claim was that of the South Star and Titus Mine, the owners of which claimed the Flagstaff vein. It was, therefore, absolutely essential to buy up this litigation. The owners claimed $1,000,000 from the Flagstaff Company. Their mine adjoined the south-east boundary of the Flagstaff, and whilst the litigation was pending the company could not work that part of their mine. That claim had now been bought up for $50,000, and the property had now been handed over to this company. Those who were able to judge stated that this purchase was one of the finest purchases the company could possibly make, and that it had increased enormously the value of their own property. It was very important that means for paying off this amount should immediately be found, and he hoped the shareholders would see that it was to their interest to assist the directors in so doing. Many rumours had been circulated, which was only natural, considering the duties they had undertaken, but he hoped the shareholders would not be led away by these rumours, but that they would have confidence in those who were managing their property—(Hear, hear.)—and that they would allow them to work out this matter to the end, leaving the board to investigate all matters. Very few of them knew the enormous amount of labour which had been attached to the direction of the company during the past 18 months, and the sacrifices which had been necessary, but he trusted that when the time should arrive for them to make the matter more clear the shareholders would support the directors in what they had done. He thought he need not make any observations on the accounts, but if there were any questions on them he would be very happy to answer them. The accounts were for two years and a quarter, the reason being that they had never been able to have an annual meeting at which the accounts could be passed. Many of the claims of creditors would run off by means of debentures or otherwise, but there was no immediate call—he thought he might say that—and that all matters would be easily arranged. Beyond that the company was in a very satisfactory condition. A telegram had been received from Mr Hunter that morning, to which he had referred, which stated:—"Roads impassable for 12 days in March. Mine working satisfactorily. Roads good now. Machinery working satisfactorily. Main shaft driven down 90 ft. further. Commence sixth level next week. Will continue sinking main shaft down for seventh level. Face of fifth level favourable indications. Another large ore body. Price of second-class ore advancing." That was very important, because at one time this so-called "iron ore" (of which there is an estimated quantity of 40,000 tons standing in the upper levels ready for taking down) was thrown away. Lately it had been selling at $15 per ton, or a net profit of 1*l.* 10*s.* per ton, and now the price was advancing. The telegram continued:—"Great competition for it. Ore body in fifth level going down towards sixth level. This is best ore in mine." With these observations he would move the adoption of the report and accounts. (Applause.)

Professor VINCENT seconded the motion.

Mr. ELLIOTT asked for a little further explanation as to the debt of $150,000. Did the 13,000*l.* also mentioned as indebtedness in Utah form part of that item?

The CHAIRMAN said it did. The 13,000*l.* was for various accounts which had been outstanding since 1874. As they were in the London books the directors had shown them in the accounts.

Mr ELLIOTT asked how it was that Mr. Davis had been able to involve the company in debts to the extent of $150,000 when his contract had been proved to be *ultra vires*? Should the claims not be struck out?——The CHAIRMAN, in reply, said it must be recollected that the debts were incurred by Patrick, who held a power of attorney for the company as manager of the company, although in his affidavit he declared himself to be a trustee of Davis. Mr. Hunter would, however, only pay those claims which after thorough investigation he found it absolutely necessary to pay. (Hear, hear.) If they were fair and legitimate creditors they could not refuse to pay them: at the same time, they were bringing an action against Mr. Davis to make him account for the ore taken out of the mine, and he would be surcharged with all these items.

Mr. ELLIOTT said, in asking his question, he had in his mind the observations of Judge Field, who has dealt with a similar case, and he would strongly advise that legal opinion should be taken on this point. He thought the contracts being invalid the company would not have to pay these claims. He had seen a parallel case, and he believed they could be disputed.

Mr. J. G. TAYLOR said he had positive information that Patrick made contracts with his own brother to cart ore for the company at $5 a ton when anybody else would have done it for $3.——The CHAIRMAN said that was stated in the evidence.

In reply to a Shareholder, the CHAIRMAN stated that, including the purchase of the South Star and Titus property, the total claims seemed to be $195,000, less 8,000*l.* due from the Last Chance Company and less $43,000 paid off in March.

Mr. STEIN asked how the directors proposed to deal with this indebtedness?

The CHAIRMAN replied that the proper way was, undoubtedly, to issue debentures and pay the claims, and they would try to get the debentures taken up. They wanted practically about 28,000*l.*, including the South Star and Titus claim. That money raised, they would immediately have remittances month by month from America to go towards paying off the interest, because 10 per cent. on 28,000*l.* would

not be much in a mine already producing at the rate of 500,000*l.* a-year. (Hear, hear.) Hitherto the debts had been paid off by Mr. Hunter out of the proceeds of the mine from time to time. They might, of course, yet recover something from Mr. Davis. The debenture indebtedness in London amounted to about 14,000*l.*

A SHAREHOLDER said 6000*l.*, and they agreed if required to provide 19,000*l.* more at 10 per cent. to assist the company; but they had not yet been asked to find this amount, as the time had not arrived.

The CHAIRMAN said the $150,000 included the judgments brought up by Mr. Hunter, and whether those judgments would be the property of the company?

Mr. SNELL asked if the $150,000 included the judgments brought up by Mr. Hunter, and whether those judgments would be the property of the company?

The CHAIRMAN replied in the affirmative to both questions.

Mr. BATTERS urged upon the meeting the desirability of furnishing funds so that the indebtedness of the company might be got rid of, and said they were all very thankful for what the directors had done on their behalf. (Hear, hear.) The shareholders should do all they could to strengthen the hands of the board.

The CHAIRMAN stated that he believed the debt of 14,000*l.* in London would be taken in debentures, and there was, therefore, 20,000*l.* more to be raised. This it was proposed to raise by means of debentures, repayable in three years, bearing 10 per cent. interest, and to issue them at the price of 90*l.* From the profits of the mine there would be ample to pay the interest, and to provide for the redemption of the debentures at the end of the three years, besides, he trusted, paying good dividends to the shareholders. There was no doubt as to the security for the debentures, and that the interest would be sent regularly.

After a further short conversation, the report and accounts were adopted unanimously.—Mr. Pearson, the retiring director, was unanimously elected with acclamation. Mr. A. Good was re-elected auditor.

The meeting closed with a vote of thanks to the Chairman and directors.

RIO TINTO COMPANY.

The fourth ordinary meeting of shareholders was held at the Cannon-street Hotel, on Thursday,

Mr. H. M. MATHESON in the chair.

Mr. R. J. FENNESSY (the secretary) read the notice calling the meeting; the report of the directors, which has already been published, was taken as read.

The CHAIRMAN said: The accounts which we have now put before you, gentlemen, have doubtless appeared to you to show a very large expenditure, and the figures are certainly large, but in point of fact they are not much in excess of those which were put before you at the beginning. The original cost of the mines was 3,850,000*l.*, and we then estimated the outlay necessary upon the railway, the pier, and the interest during construction (we under-estimated it no doubt) at 1,555,000*l.*, together 5,405,000*l.*, and I do not think we can be very much blamed if the amount both in regard to cost and in regard to the time taken has been somewhat exceeded in an enterprise of this gigantic nature. It has been so, but taking the extreme sum of the present accounts, omitting only from it the cash in hand and the other balances which are to the fore, 5,993,000*l.*, there is only an increase of 588,000*l.* Now, if we take the half of that as the interest on the additional time taken before produce begins, and the half of it upon additional works, we do not appear to be so very far out from the estimates taken at the very beginning of this enterprise. My task to-day is not an easy one, but I think I may rely upon your kind indulgence to listen patiently to the statements which I have to make, and I shall endeavour to make them as explicit as possible, and explain to you the present position and prospects of the undertaking. (Hear, hear.) If any one supposes that we have altered and that we can alter our view in regard to the future of this company they are very much mistaken; beyond the fact that the works for putting the company's property into a state to yield us the results which we reckoned upon have been more extensive, and have taken a longer time than we could have anticipated, there is nothing in these accounts which we consider at all exceptional. (Hear, hear.) Gentlemen, you will remember that in addition to a freehold property containing the valuable mines, in regard to the extent and value of which I need not say at this period another word—in addition to the freehold mines you possess a completed railway of 50 miles long to the seaport, fully equipped, and a pier. This last is constructed upon a scale which your directors considered desirable in the interests of the company—larger than what was absolutely required for our present mineral traffic, but designed to provide also for the increasing requirements of the trade of the port of Huelva, which is now the largest shipping port in the entire Peninsula; and if you ask me why we have concerned ourselves about the interests of the port of Huelva, I have merely to reply that it is essential for us to provide that there shall be a steady supply of shipping at a moderate scale of freight, and by doing what was in our power to promote the trade of the port, in imports as well as in exports, we did what we could to secure this result and to cheapen the homeward freight for our minerals, which is a very important factor in the good results we look for. (Hear, hear.) Now, we are well aware that the results of the working have not yet reached the point which we confidently expected they would have done when we met you last year, but I hope to show you not only that our greatest exertions, and those of the management in Spain, have been used to lay the foundation for a large and profitable business, but also that the position which has now been attained is such that you will yourselves be able to judge whether we are not warranted in anticipating that your expectations and ours will be realised. Before going into a few details, I may be permitted to refer for a moment to the deplorable condition of general trade; every industry in the country is more or less depressed—the coal trade, the iron trade, and I may say very specially the agricultural interest, probably to a greater extent than for many years past, has been depressed, and that is an interest on which the principal item of our produce very largely depends for its consumption; but I believe that we are entitled to derive comfort from that which may be a cause of present loss, and we may reasonably expect that the low price of pyrites, whilst it has been a necessity for the chemical trade, will hereafter lead to a wider consumption of those chemical products of which sulphuric acid forms the principal ingredient. The depression of the agricultural interest alone will necessitate the use of those stimulating manures, which, it is well known, are the best means of increasing the productiveness of the soil. I do not mean on this occasion to weary you with an explanation of the processes of working these mines; these have been fully given on former occasions, but a few details must be given you in order to put you in possession of the present state of the company's works. The uncovering of the mineral contained in that small portion of the vast deposits at Rio Tinto, which is now being quarried or worked by opencast, has made great progress, and the ore is being extracted from three different levels, and is now producing 15,000 tons of mineral per week, or at the rate of between 700,000 and 800,000 tons per year; that is the rate at which, for several weeks past, the mineral has been extracted. The extraction by mining underground was entirely discontinued last November, but it will probably be resumed to some extent should the board be advised to take that course by the consulting mining engineer, who is now on a special visit to Rio Tinto. Of this large quantity of ore 260,000, or 280,000 tons are to be sent forward during this present year for shipment, for delivery under contracts which have been actually entered into with buyers, and the remainder will be sent to the calcination ground to be treated for the production of copper on the spot. Now, these figures would, under what I may call normal conditions, yield us a very handsome result upon the capital expended upon this concern, large as it is; and they would go far to justify the rather sanguine expectation originally held out upon this head. There are several causes—I may state three causes—which at present have operated to modify the reasonable expectations which were then formed. The time taken to develope the works necessary for this large extraction has been greater than was foreseen, and I may say greater than could have been foreseen. It is since we met you last year that the direction in which those works had to be carried and extended has been more definitely decided upon than it had previously been. This has had the effect of accumulating interest against us, and consequently of increasing the amount of outlay upon which interest is payable. Then, a second reason is that the ore now being worked in the upper part of the opencast or quarry has not yielded us the copper contents upon which we were relying. The opinion of Mr. David Forbes, our late consulting engineer, was that the ore from the upper part of the lode might not prove of such quality as to be suitable for shipment, owing to probable oxidation; it was found, however, that the sulphur contents were more than sufficient to come up to the standard, and rather exceeded it, and, in order to lower as much as possible the expenses of the output, by saving the comparatively heavy cost of mining underground, we adopted the opencast system for all the mineral which was necessary to be produced. In doing so we relied upon the principle of selection, which is that in use in all the mines of a similar description to our own. We anticipated that by this system of selection so soon as the face of ore which was being worked was sufficiently extended we should obtain the copper contents necessary to give us the large profit on that part of the business which we expected, but, from whatever cause, the selection has not yet given us the copper contents that we looked for. A considerable improvement in this respect took place during the latter part of 1876, and we have put on foot measures, energetic measures, to provide better selection, and if it should be necessary we mean to return, to some extent, to mining underground, even at the difference of cost which is represented as about 5*s.* against less than 2*s.*, which it costs to quarry the mineral. There is not the slightest doubt, gentlemen, that this mine contains ores as rich in copper as those of the other similar mines which are well known, and which have been worked for a longer period by English capitalists. Careful surveys are also being made of the other lodes which have hitherto been untouched by us, and which are of very great extent, some of them virgin ore, and others of them already worked for many years by the Romans and others for copper alone. Then, there is another modifying circumstance, that although we allowed in our estimates a considerable deduction from the current price of sulpher at the time we began business a total reduction in the price of that article to the extent of 50 per cent. has taken place since that period, and such is the state of the chemical trade that I believe it is not expected that any great rally may be seen soon. Whilst, therefore, at the outset of the business it was intended principally to rely upon the export of pyrites, and only in a secondary way upon the production of copper upon the spot, this serious change in the condition of the market has forced upon us the question whether we should not take as the chief basis of the business the production of copper; whilst, at the same time, continuing to send forward for shipment the best ore suitable for the market. We find from experience that the low price at which the ore can be extracted, and the moderate cost at which copper can be produced by the cementation process, amply justify this change in our views for the future working of the business. We found in practice that the lowest price of copper ruling, or likely to rule, in this market would leave a large margin of profit for the company, and as the quantity of ore applicable to this manufacture is exceedingly large all that was necessary was to provide on a sufficiently large scale, and with the utmost amount of convenience, for economy of working, the means of transporting the mineral upon the ground, and of calcining and washing it, and precipitating the copper. But there is a peculiar feature of this method of dealing with our mineral which forced itself upon our attention, and which had much influence in inducing us to make the change of plan which I have just indicated. After the ore has been calcined about 1 per cent. of the copper contents of that ore becomes immediately soluble, and is at once extracted from the burnt mineral by the water applied to it in the tanks; the remainder of the copper, consisting generally of about an equal quantity—say, 1 per cent. or a little more—remains in the waste, and becomes available gradually by exposure to the air, and by the application of water during a period of from five to six, and even a longer period of years. The part of the produce which is thus obtainable is the more valuable because it has very little expense to meet. For example, supposing that 400,000 tons of mineral are burnt in one year. This quantity would yield us by the washing and cementation tanks 4000 tons of metallic copper, but an equal quantity of about 4000 tons of metallic copper remain in what are called "waste heaps," to be obtained gradually—say, in five or six years, or even more—by applying water to these heaps. We have in operation on the waste heaps at Rio Tinto two large steam-pumps, which are constantly employed in pumping water upon them, so that copper water may be produced to be used in the cementation tanks. From this it is evident that this last 4000 tons of copper that remains in the waste heaps form a sound, large reserve for the company, which as we go on with calcination will increase; or, to put it in other words, it materially reduces the price at which we produce the copper on the spot. I have entered into these details of the company's trade somewhat reluctantly, but I have done it because I feel that you are entitled to receive from us the fullest explanations of the increased outlay that has been incurred during the past year. A large new system of tanks, both for washing and precipitating, has been constructed. The first portion of these new tanks is just about to come into operation. Then a large reservoir has been most successfully completed, containing a very large supply of water, now full; and that, along with the other means which we had already provided, it is calculated, will be amply sufficient for all the purposes of the cementation works on the largest scale. Railway lines have been constructed all through the calcining grounds, which have been very much extended. Engines and other stock had to be provided. It is only since May last that the ore for calcination began to be erected in telaras and burned, and as these telaras take at least six months to burn, a very small portion of the copper we produced and sold in the market last year came from that source. It was chiefly derived from the drainage of the mine, and from the water thrown on the old heaps to which I have already referred. I might here say that we have taken no credit in the accounts of the company for these old heaps. They were left upon the ground by the Spanish Government. They made us pay for the telaras or calcined heaps of ore unwashed that they handed over to us, but the immense masses of waste heaps were not put, into the inventory that was paid for by the company. They contain a large amount of copper, and by the process which I have explained are made to yield copper so as to assist considerably the production of that valuable metal. Now, after all these things have been said, and have been weighed at their proper value, you will no doubt ask me—"What about the future; what are we to expect for all our outlay, and how soon may we begin to receive some return?" This year—during 1877—for the first quarter the copper manufactured on the spot has reached the amount of 600 tons of metallic copper. That has been done without any of the increased tank accommodation to which I have already referred—just with the old means of production—and we estimate on a very moderate calculation that there will be produced during the year 4000 or 4200 tons of metallic copper. (Applause.) I have already referred to the export of pyrites under contract—260,000 or 280,000 tons. From these principal sources of income, and from other subordinate ones, I have no hesitation myself in saying that I entertain a strong hope that we shall have something over after discharging all claims for interest on bonds and on borrowed money, and all expenses. The interest and expenses will certainly be met. (Applause.) How much will remain I cannot venture to say, and I hardly think you can ask me to do so. (Hear, hear.) But this I may say for my colleagues and myself—that there will be a desire on our part to communicate to you at an intermediate period how matters are progressing. Our estimates, however, necessarily extend beyond the year 1877, and I may with perfect safety assure you that with the most ordinary fortune from the contracts already made, and the means of copper production which will then be in more extended operation, we may confidently anticipate such results for 1878 as will go far to reassure the most timid of our shareholders. I will only add, that as in the past, my own most constant and strenuous exertions, as well as those of my colleagues, will continue to be made in order to forward your interests. Those interests are very large, and, as you are doubtless aware, we are ourselves very largely concerned with you, and have no interests that are different from your own. I have some delicacy in saying it, but those immediately connected with myself have given abundant proof of their confidence in the success of this undertaking by the strong support which they have given to it. I trust I have made plain the various points which have been touched upon, and it will be my desire to satisfy, as far as it may be proper in your interests, every shareholder now present, and to answer all the questions that any of you may wish to put to me in connection with the business. We are here, of course, fully informed about the business, but as traders it may not be prudent to answer everything that anyone may ask; at the same time I shall do my very utmost to satisfy any shareholder that has any scruples or difficulties that he wishes to be explained. I conclude by moving—"That the report and accounts now presented be received and adopted."

Mr. WILLIAM MACANDREW (the deputy-Chairman): I beg leave to second that motion.

The CHAIRMAN: I may just say that before we close the meeting the proposal must be made again that the auditors be re-appointed. It is necessary at each meeting that auditors should be freshly appointed, and a motion will have to be submitted to that effect.

Mr. POWELL said many of the shareholders would, he thought, like to see a revenue account for the year, and that it should be continued yearly, in order that the full details of the expenditure for the year might be given, so that the shareholders could compare them with the preceding year. With respect to the observation made by the Chairman as to the increased cost, he held in his hand a copy of the original prospectus, in which the estimated cost was put at 2,700,000*l.* Now, the actual cost had reached within a trifling amount of 6,000,000*l.*

The CHAIRMAN: But you have only taken three years payment out of the ten annual payments to the Spanish Government. That 2,700,000*l.* is all we estimated in making that statement.

Mr. POWELL: I see that that is so. I will confine my observations to the first remark then.

Mr. HAMILTON remarked that he understood the Chairman to say that the present figures go far to justify the anticipations originally held out. Now, he had expected something like 10 per cent. for the original shareholders, and he would ask whether the Chairman could give the shareholders any idea when it is likely that the original shareholders would get anything like a decent dividend from the mine?

The CHAIRMAN: In reply to Mr. Powell, we should have been very glad, and we had some hopes, and I said so last year, of presenting a profit and loss account for the working of the year 1876. I have, however, been obliged to confess that the preparation of the work has taken longer—very considerably longer—than any of us anticipated, and that it would have been a mixed account, a very large portion of it was for capital, and a very moderate proportion would be put against the real income and results, and that, therefore, acting under the advice of Messrs. Turquand, Youngs, and Company, we abandoned the idea of attempting a profit and loss account absolutely for last year, and determined to throw everything into capital down to a period from which to begin absolutely the new system, and certainly without any question of whether we make a loss or a profit, it may be relied upon that a revenue account will be presented. There must be some further expenditure on capital—I know there is, because the tanks and lines of rail to which I have referred are not quite completed, and there will be some slight addition in that item, but we shall present a revenue account for the current 12 months. In regard to Mr. Hamilton's observation, what I said was that under normal conditions the figures which I gave to you as the output of the mineral and so on would have yielded us something like the results we had led you to expect, but the enormous depreciation in the price of sulphur, and the price of copper also probably lower than the average, decidedly it is so—make it impossible for us to dream of the results for that output that we then said were likely. At the same time we can very largely extend the output from what was then contemplated, and I am in hopes by a larger production of copper that we shall get what Mr. Hamilton would consider a satisfactory result. I believe there will be a result to satisfy Mr. Hamilton and the rest of the shareholders.

Mr. POWELL: May I ask what was the loss by the bullion robbery to the company, and if steps have been taken against a repetition of such an event?—The CHAIRMAN: I am very sorry to say that the loss by the bullion robbery was a very considerable one—8200*l.* is about the amount that was stolen from the diligence on that occasion. We have made an amicable arrangement with the agents of the company to divide the loss between them and us. It was impossible to fix absolutely the liability for that loss, and the directors felt it was desirable that we should make some settlement. After considerable delay that is the settlement we have lately made in connection with it, but the utmost possible care will in future be taken. Any bullion which has been transmitted from one place to another has ever since been accompanied by *guardias civiles*, and every means by intimation to the authorities of the transit of the bullion has been taken to prevent a mishap, but for the most part we have got the bullion required from Huelva without having to go beyond that for it.

Mr. MEISSNER: Will the expenses be about the same next year as they have been during the past four years?—The CHAIRMAN: There is a very large staff, and I can only assure the meeting that every effort will be made to economise as far as possible. We cannot employ inferior labour, but economy is being studied to the utmost of our power.

A SHAREHOLDER: There are two items in the accounts—"Profits on sales of produce, 157,539*l.*;" and "Produce shipped and remaining on hand in Great Britain and elsewhere, as per inventories, 66,253*l.*" Do I understand that that is the whole produce up to the present time? Together about 220,000*l.*—The CHAIRMAN: Substantially it is so. They have been subjected before coming to these figures to every possible deduction. They do not fairly represent all the produce we have had. Nothing in existence on the mines in process of working has been taken into account in these figures, but will be found under another item.

The report and accounts were then unanimously adopted.

Mr. SKINNER: Now, Sir, I beg to propose that Messrs. Turquand, Youngs and Co., be re-elected auditors of the company for the current year. Their names are so well known to all here that I am sure they do not require any recommendation from me.

Mr. SURGEY seconded the motion, which was carried.

Mr. HAMILTON proposed with great pleasure a vote of thanks to the Chairman and directors for the manner in which the business had been conducted. Whatever might be the position of the company they all knew that it was in thoroughly good hands, and that everything possible will be done to make it successful.

Mr ANDERSON seconded the motion, which was carried with acclamation.

The CHAIRMAN: I am very much obliged to you indeed, on the part of my colleagues and myself, for the very kind confidence which you have been pleased to express through Mr. Hamilton and by this vote. You may rest assured nothing will be wanting on our part to carry forward this great enterprise to a success which I have every reason to expect will be satisfactory to you ere long.

The proceedings then terminated.

SANTA BARBARA GOLD MINING COMPANY.

The sixth annual general meeting of shareholders was held on Monday at the office of the company, Cook-street, Liverpool,

Mr. P. S. HOLLAND in the chair.

The SECRETARY read the notice convening the meeting and the minutes of the last meeting. The report and statement of accounts were taken as read.

The CHAIRMAN then said that the report gave such full information that he would make but few remarks on it; the progress of the company the shareholders would perceive was steady, and some 2000 tons of mineral had been stamped in the past year in excess of the quantity treated in 1875; this increased output, together with the additional yield per ton of stone, as compared with the same year of about 2*s.* per ton, accounted for the increased value of the gold obtained amounting to some 4000*l.*, roughly speaking, above the produce of 1875, while the expenses not showing an increase of much over 1000*l.*, the results accordingly show a gain of 3000*l.* in profits over the year 1875. The prospects for 1877, although the operations at the mine have been much interfered with by the unfortunate floods experienced in February, are encouraging, for there is little doubt, I think, that later on in the year more force can be put to extract mineral from the stopes below the adit, where the lode has a very promising appearance; and apart from any increase in the produce per ton, every additional 100 tons of ore raised in the month will make a great difference in the profits by reason of the expenses showing but a small relative increase, and now that we are so amply provided with stamping power we could show much better results if we can raise 1500 tons of good mineral per month. Respecting the damage done to our water-courses owing to the floods, the board are not informed what outlay will be necessary to put matters to rights, but they believe it will be inconsiderable. The directors propose in the report to carry forward a considerable sum, besides adding to the reserve, and this they have been mainly induced to recommend, in order that the position of the company may be strengthened as regards this year's dividends, as our desire is to maintain a steady dividend if possible, and this is, doubtless, your view as well. The new seurfala, or houses for blacks, has been completed during the year, and will I hope enable Mr. Hilcke to increase the number of our labourers. I trust the outlay on capital account has now nearly come to an end, this being an account that I should like to see closed as far as practicable at an early date, but at the same time the works that have been debited to capital are all necessary for the proper advantageous working of the mine, to which such outlays are indispensable if it is to be developed advantageously. But a small amount will be required for the purchase of the outlying properties alluded to in the report, and the acquisition of these will, no doubt, be of great advantage to the company. I do not think that there is anything further that I can say to interest you, the report, as I before said, being intended to give you the fullest information. I beg now to move, "That the report of the directors, with statement of accounts for the year ending Dec. 31, 1876, be received and adopted, and that a dividend of 1*s.* 3*d.* per share be declared, making with interim dividend paid a total of 2*s.* 6*d.* per share on the year."

Mr. A. PIGGOTT FLETCHER seconded the motion, remarking that he thought the position of their property had been clearly laid before the shareholders.

After a discussion in which several shareholders expressed their satisfaction with the plan issued with the report, enabling them to understand the workings of the mine better than heretofore, and also their confidence in the management, the CHAIRMAN put the resolution for the adoption of the report and accounts, and the payment of a dividend of 1*s.* 3*d.* per share on May 19, which were carried unanimously.—Resolutions were then passed unanimously re-electing Mr. A. Piggott Fletcher a director of the company, and Mr. A. W. Chalmers as auditor.

The CHAIRMAN subsequently moved that the best thanks of this meeting be given to Mr. Hilske and the staff at Pari for their services to the company during the year 1876, which was seconded by Mr. W. WILLIAMSON, and unanimously carried.

A vote of thanks to the Chairman and directors closed the proceedings.

CWM DWYFOR MINING COMPANY.

The statutory meeting of shareholders was held at the company's offices, St. Clement's House, on Wednesday,

Mr. J. TURNBULL in the chair.

Mr. GEORGE J. GRAY (the secretary) read the notice convening the meeting, and the subjoined report of the agent was submitted:—

May 1.—I beg to hand you the following report of the work accomplished in these mines since they were started to work by the new company four weeks ago; also to draw your attention to some of the main points which are to be operated on:—Surface: The flat-rod stands which were blown down have been fixed in their proper places. We have also completed the roofs of the storehouse and smiths' shop. The roof of the powder magazine will be completed by the end of the present week. A drain has been made around the collar of Stewart's shaft to carry off the surface water.—Underground: We succeeded in draining the mine of water to the bottom without any hindrance, and have since sunk Stewart's shaft 2 ft. 2 in. for a fork—present depth 9 fms. 5 ft. 8 in. below the 10 fm. level. We shall sink 6 in. more, which will be completed this week, when a collar will be fixed 2 ft. 6 in. above the bottom of the shaft, and a portion of the north ground cut away for a lodge and barrow road, when the shaftmen (six) will raise the collar of Stewart's shaft 4 ft. higher for a tip, case and divide the shaft from the surface to the 20 fm. level, and fix the ladder road preparatory to starting a level west under the run of ore ground driven through at the 10 fm. level. I shall hurry things on as quickly as possible. I intend next week to put a pare of men to stope the roof of the 10 fm level west on the caunter branch. I shall then fix stull, and soon after put men to sink a winze on the junction of the lodes from the 10 to the 20 fm. level. After this work is completed I consider we shall have a good section of available ground for stoping.—JOSEPH JEWELL.

The CHAIRMAN said this was simply a formal meeting, and under the circumstances they would not have a great deal to report, but he thought they would consider their position satisfactory. They would recollect that the company was formed to take over the property of the former one. The position of the property when the old company ceased operations was very clearly shown in the report of Capt. Jewell, dated Sept. 13, on the then condition and future prospects of the mine. He recommended the sinking of Stewart's shaft a few feet deeper, so that a level might be started west from the shaft, as, judging from the dip of the slate strata, there would be only from 2 to 3 fms. to drive in that direction before they met with the run of lead ground driven through in the 10, where the lode was richer and larger in the bottom of that level than in any other part of the drivage. By extending a 20 fm. level further west they will also intersect the slide met with at the 10, where the lode proved very productive for lead, and there is everything in the character and appearance of the lode driven through to lead any experienced miner to calculate on having a much more valuable lode at the 20. He would also advise the sinking of a winze in the bottom of the 10, at the junction of No. 4 lode south and the caunter branch, to render that section of ore ground available for stoping. In conclusion, he stated that when stoping is recommenced the returns will greatly increase, and when in full working order, with the ground properly laid open, he fully believes satisfactory results will be obtained. He strongly recommended the shareholders to complete the development of the mines with all the energy which he believes them to deserve. There had been some little delay in connection with the present company's operations, but, as would be seen by Capt. Jewell's report of May 1, the works at the mine were now in active progress. So far as the present company was concerned the property cost them 8665*l.*, which they considered was a satisfactory bargain. The old shareholders took 8237 shares in the present company, and 1393 shares had been subscribed by the outside public, so that 9630 shares in all were taken up, giving them a capital of 5514*l.* The old shareholders had paid 5*s.* per share (in addition to the 10*s.* per share credited to them, representing part of the purchase money for the property, and the new shareholders had paid up 15*s.* per share. They had paid off certain liabilities which they took over, and expended 362*l.* on new operations, and their present liabilities were 2335*l.*, which included 1100*l.* for balance of purchase-money, the remainder being for wages, interest on mortgage debt, and other small items. Their present available funds were nearly absorbed, but a call would be unnecessary at present if it could be arranged to place some of the unallotted shares. They intended to issue 12,000 shares, and if the shareholders would assist in placing the remainder it would give them a good position. During the interval for transferring the property the water rose in the mine, but this had now been got out, and in a week or two they would be working on a favourable lode.

The SECRETARY, in explanation of the agent's report, stated that their operations were carried on upon the southernmost of eight parallel lodes, and that the present workings would soon come in under the ore, which had proved very rich in the level above, and there were good indications of other lodes.

A SHAREHOLDER enquired whether a prospectus could not be advertised, with a view to obtain subscriptions for the unallotted shares.

Mr. TAYLOR feared that no useful result would follow in the present state of commercial affairs, and thought it best to get the ore out among their friends.

A SHAREHOLDER suggested that the remaining 5*s.* per share on the 9630 shares already issued should be called up, as the mine would then be placed in such a position that outsiders would be glad to take up the unallotted shares, even at a premium.

The CHAIRMAN thought the pleasantest way of raising the money would be to issue the unallotted shares now, leaving the uncalled capital as a reserve fund.

Mr. TAYLOR remarked that the directors had taken their full proportion of the capital issued; and, in fact, had about one third of the whole. He had himself paid 1*l.* 15*s.* per share for some of his shares in the old company, and the true position of the case was that those who came in at par obtained for 20*s.* per share what had cost the present holders 30*s.* per share. If they got the whole 12,000*l.* subscribed, it would be for what had cost the old company 18,000*l.* A large number of his friends had subscribed entirely on the faith they had in his own confidence that the mine was a good one, and he believed it will ultimately be so.

The SECRETARY said that the Brwsy Coed on the other side of the mountain had been successfully working for the last 100 years. A yield of 30 tons of lead per month would give 20 per cent. upon the entire capital. Of course, they did not expect to get that at once, but they anticipated doing so when the mine is developed.

Mr. BARTON said that 100*l.* per month was required to carry on operations at the mine, for they must not look to sales of ore at present.

The CHAIRMAN said that four or five weeks would suffice to let them see the result of the present operations.

It was ultimately resolved to issue 2307 of the remaining unallotted shares, so as to make the total capital up to 12,000*l.*

The SECRETARY, in reply to an enquiry, said that a call of 2*s.* 6*d.* per share would produce 1100*l.* or 1200*l.*

Thanks were then voted to the CHAIRMAN, who in acknowledging the compliment expressed the hope that at their next meeting they would have successful results to communicate.

ST. BREWARD GREAT ONSLOW CONSOLS MINING CO.

The ordinary general meeting of shareholders was held at the company's offices, 33, Abchurch-lane, on Monday, when it was expected that Capt. Thomas Dunn would have been present from the mine, but through illness he was prevented. The CHAIRMAN read a written report from him, as follows:—

As I am prevented through illness from being present with you I herewith hand you a rough report of our proceedings, and what we have been doing at the mine. Although we fall short of my expectations by way of cutting copper ore, yet our prospects, I am happy to say, are such as will warrant the strictest investigation of the most practical of mining men. Of late every fathom we drive tells its own tale. Since we have passed through the caunter lode, running north and south (about 18 in. to 2 ft. wide), the end in driving east has scarcely ever been without copper. The box, containing gossan, mundic, and black oxide of copper, that I have just sent up to you has all been broken since we have passed through this caunter lode. I could have sent you a ton weight of similar stuff. It does appear to me as though we are driving towards or on the back of a large deposit of copper ore. All we want is a little more patience, perseverance, and orders to employ more men, so as to be sinking the shaft, and success is certain. Copper ore is here, and we must have it. Look well into the sample of the lode in the box. Since we commenced operations we have driven about 65 fms.; we have now about 35 fms. more to drive before we reach the shaft. The ground has been very favourable for driving, never exceeding a cost of 5*l.* per ton, and stands without timber. We used timber only about the first 15 fms. We commenced driving in June, 1876; the cost sheet will show the prices paid and the length driven from time to time. Since then we have altered the machinery, erected a new wheel-pit nearer to the shaft, with rods and bobs complete. We have also erected a drawing machine, and attached it to the water wheel. We have bought and erected a capstan, shears, and pulleys, covered in the capstan, raised the collar of the engine shaft, built a dry house for the men to change in, built a new carpenters' shop, and have also built a stone wall round the wheel pit to prevent the water from being blown back by the gales of wind. We also have had to re-build a part of the wall of the iron yard which was blown down by the violence of the recent storms; they, however, did us no other damage. We have had to make and put about 80 fms. of wooden air-pipe into the adit level to throw air up to the men. This is done by a small water-wheel (home made) put in below our adit level, the water running therefrom works this wheel, and by the aid of of a fan-machine the men get good air to work in. To conclude, I believe that we are on the very verge of copper, and I invite any or all of our friends to make personal inspection of the mine; if better at no slight a depth can be found in Devon or Cornwall I shall be very much surprised.—THOMAS DUNN.

The CHAIRMAN, who has several times made personal inspection of the property and workings, referred to the correctness of the reports given by the late Mr. N. Ennor in the *Mining Journal* of August 24 and 31, 1872, September 28, 1872, and July 26, 1873, at which time the property was in other but not better hands. Since the date of those reports an adit has been driven above the River Camel, which will cut into the engine-shaft at a depth of about 30 fms. from the surface; it runs from the very mouth upon an east and west lode varying in size and appearance, but for the most part it is wider than the adit itself, which is 5 ft. wide at the bottom, 3 ft. at the top, and 7 ft. high; in some places this lode has been proved to be over 9 ft. wide; it is a massive one, it lies between the elvan and killas, and contains throughout gossan, mundic, peach, prian, and quartz, with spots of copper ore. A caunter lode about 18 in. wide was cut some few months ago on the north side only, consisting mainly of quartz, in which is some small pieces of yellow copper ore, and within the last few weeks another caunter lode (which the Chairman has not yet seen) running both north and south of the main lode has been cut; specimens of the lode have been sent up on two or three occasions, and were exhibited to the shareholders present. Those not present, and intending investors, are also invited to come to the office and look well at the stuff for themselves. The ribbon-like structure so favourably described in Mr. J. Clark Jefferson's notes of Herr Borgrath Dr. Von Groddeck's lectures at Clausthal, published in the *Mining Journal* of recent dates, is in one part of the lode, and is to be seen amongst the specimens; this stuff came from the slight depth of 12 to 15 fms. from the surface, being much larger and distinct in its character at the bottom than the top of the level. The adit level cuts through a deep bed of gossan, it crops out to the surface, and it forms the main part of the lode throughout to a depth of 120 to 150 feet. The appearances are such that the company may expect an early good result; in fact he (the Chairman) would not be surprised at any time to receive a telegram announcing that a course of ore in the lode has been cut. He regretted to have to state that progress has been necessarily slow on account of the difficulty of getting in money, nearly all that obtained being in small amounts, and from friends. He is anxious to have the shaft going as well as the adit level, but to do this more money must be subscribed. He, therefore, urged the shareholders to induce their friends to join in the undertaking. The whole concern is a small one—2400 shares of 5*l.* each—and if 200, or at most 300, of the unplaced shares were issued, not another penny would be required to make the mine not only self-supporting, but to return large dividends, because copper pyrites with an average of 30 to 36 per cent. of copper could not fail to pay when obtained at some 25 to 40 fms. from the surface. There is a sufficient supply of water for all working purposes, consequently the expenses will be very light. The fall of water is ample for five or six wheels (in case of need) one below another before it reaches the River Camel. The existing water wheel—18 ft. by 5 ft. 3 in.—has a superabundant supply of water, and power at all seasons of the year for both pumping and lifting at the engine-shaft.

PENNERLEY MINING COMPANY.

A special general meeting of shareholders was held at the offices of the company, Austinfriars, on Wednesday,

Mr. PETER WATSON in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting, and the following report:—

April 28.—We beg to lay before you a full report of this mine for the general meeting on the 2nd proximo, showing the present position and appearance of the workings, and recommendations for future development.—Engine-Shaft: The 130 west, on Big Ore lode, assumes the same promising appearance as for some time past; the lode is 1 ft. wide—carbonate of lime, impregnated with lead ore. There is yet 25 or 30 fms. to the shale, and as it is in character with the lodes in this mine that a bunch of lead follows the intersection thereof, it is very desirable this level should be continued to that point. The Warm Water lode has been intersected by cross-cut 10 fms. behind the present end, but nothing further has been done. This level east has been extended 13 fms., the lode varying in size from 1½ ft. to 3 ft., of carbonate of lime of a congenial character and occasional stones of ore, with every favourable sign of improving as the level advances. The run of ore gone down in bottom of the 120 has evidently taken a more easterly dip, and consequently prolonged the distance to drive for this discovery. There is yet 100 fms. to reach Bland's shaft, which is sunk only 65 fms., and as in the upper levels great quantities of ore have been raised, gives great encouragement for driving this level forwards; and here we may state that east of the east and west lode the shoots of ore incline eastward, while to the west—in the opposite direction—this will naturally increase the distance to drive to enter these runs of ore. The ventilation is good, having recently communicated No. 1 winze with the level on the Big Ore lode. The lode in the 120 west is 1 ft. wide, carbonate of lime and a little lead ore, not sufficient to value; there is about 18 fms. in the shale, and by continuing this drivage the same results may be looked for as in the level below. Just behind the forebreast a cross-cut is in progress to intersect the Warm Water lode: about 9 ft. further will accomplish this very important object. Judging from the character and productiveness of the lode in bottom of the 80, there is every encouragement in looking for similar results at this point. The stope in back of this level has greatly improved of late, now worth 2 tons per fathom. This level east has been extended 13½ fms., a portion of which was through a profitable run of ore, on which a winze is being sunk, and worth 2 tons lead ore per fathom; the water is rather troublesome for progress, but will before long be drained by workings below. The lode in the forebreast is ½ ft. wide, composed of carbonate of lime, slightly charged with lead ore. This is also an important point, and with the level below should be driven forward towards Bland's shaft, and winzes sunk for ventilation and advantage in stoping and thoroughly exploring this section of lodes. The distance between this and the 80 being 40 fms. may eventually necessitate the driving an intermediate level for convenience and speedier development. The 80 has been driven west on the Warm Water lode for a number of fathoms, opening out profitable stoping ground. The lode in the end is 1 ft. wide, worth 10 cwts. of ore per fathom. For the benefit of stoping ground this level should also be speedily pushed forward. A winze is in course of sinking below this level: the lode is 2½ ft. wide, worth 3 tons of lead ore per fathom. This is preparing stoping ground, and the course of ore appears lineable with the cross-cut in the 120. A stope east of said winze is worth 1½ ton per fathom. The stope west is worth 2 tons per fm. No. 1 stope, in roof of this level, is worth 1 ton of lead ore per fathom. No. 2 stope, 1½ ton; and No. 3 stope 1¼ ton per fathom. The lode in the 90 west is 1½ ft. wide, composed of carbonate of lime, containing a little ore. A pitch is being worked in bottom of the 60, in advance of this level, worth 1 ton per fm.: by further extending this level this run of ore will, doubtless, be met with in course of progress. In the cross-cut in the 60, to cut the north lode at the point of intersection, the lode is twitched, and for the present suspended. In this section of the mine we have seven tribute pitches at work, at prices from 8*l.* to 10*l.* per ton.

Potter's Pit: The cross-cut at the 90 has been continued to the north lode, on which 40 fms. have been driven: the lode yielding ore in paying quantities, and leaving profitable stoping ground. No. 1 winze, 20 fms. west of cross cut, has been driven 3 fms., the lode yielding 1 ton per fathom. No. 2 winze, 20 fms. east of this point, has been deepened 10 fms. in a productive run of ore, producing 4 tons of ore per fathom. This has been a continuous course of valuable lode from the adit level downwards, its length is from 8 to 10 fms., and usually carried down by two winzes, and subsequently stoping the one standing between them. There is no doubt the richest deposit lies yet deeper; as evidence of this there are several branches as feeders on this point of junction with this lode, and the excessive heat arising from the bottom gives every encouragement for this confidence, and this would also have been further proved by development had it not, through the unprecedented wet season we have just experienced, brought down so much water as to compel us to abandon operations, not only in this winze, but at this level, the water being now at the roof. A cross-cut has been commenced to intersect the Big Ore and Warm Water lodes at this level, and extended 2 fms. At the 75 and 65 little has been done other than by tributers: there yet remain several trials of this class at high prices, which may ultimately lead to more profitable results. The 55 has been driven west on the Big Ore lode 10 fms. Here the object is twofold—first, to prove the character and value of this lode, which at present contains some good stores of lead, and further to intersect Wilson's lode, which is calculated to junction in about 8 fms. from the forebreast, and where good results may be expected. The 45 has been driven east on Wilson's lode several fathoms, laying open paying ground for tributers. The 35 has also been extended 18 fms., yielding fair quantities of ore. The 25 has been driven east 20 fms. with similar results. These levels are for the present suspended. Several other trials have been made, and, although resulted in no great discoveries, have led the way for future development. In this section of the mine there are four pitches at work, at prices from 8*l.* to 10*l.* per ton.

From the above remarks it is very evident no rich discoveries or amount of reserves are available. The several levels, winzes, and stopes require to be closely watched, and other sections of lode laid open to enable returns to be continued, and a successful end attained. For this object we beg to recommend the following, providing funds can be obtained:—The 130 both east and west to be driven forward, the latter to the shale and the former towards Bland's shaft. The 120 east and west to follow jointly the 130. On reaching the shaft eastward a communication to be effected therewith. The levels to be continued east, and eventually cross-cut to the north lode, which will be some 30 fms. deeper than the winze at Potter's Pit; this we consider possibly may drain the water therefrom. These levels may be driven by machinery for expedition. The cross-cut continued to Warm Water lode. The 80 and 70 extended west to the shale. At Potter's Pit it will be expedient to erect a more powerful engine, and means applied for removing the water, in case the dry weather and deeper workings do not affect it. The shaft sunk deeper, and cross cuts put out to other lodes, and levels now idle resumed. These operations, carefully conducted and expeditiously performed, will, we confidently believe, develope the mine to that extent that a large amount of reserves of ore will be accumulated, and the mine placed in a remunerating position. Further, should the 130 prove to expectation, it would at once decide the question of sinking the engine-shaft to deeper levels. The machinery is in good working condition, the 60-in. cylinder pumping engine keeping the water without difficulty. We should here remark also that the stopping the Bog Mine, and the wet season already referred to, necessitate the engine to work faster, which has both increased the expense in consumption of coal, and otherwise interfered with operations, but we apprehend no serious difficulty.—W. T. HARRIS, J. DELBRIDGE.

The CHAIRMAN said he thought it was necessary that he should say a few words in explanation of the resolutions which the secretary had just read. They were unfortunately placed in this position—that owing to the Bury Port Company's draft for 1716*l.* 5*s.* not being paid they would have to provide for it, as the bank had discounted the bill, and the balance of the company at the bank was only 22*l.* It had been hoped against hope that the riches of the mine would have enabled them to pull through, but with this 1716*l.* 5*s.*, and the existing liabilities of the company, it was necessary at once to raise fresh capital. Within the past two months he had been called upon to preside over the affairs of the company, and instead of running away from the ship he was there to see if it could not be saved. (Hear, hear.) The directors and Mr. Lavington had taken counsel's opinion in order to see what was the best means of raising capital, and after considerable deliberation they had, with the assistance of Mr. Bunting, who was one of the best authorities on such matters, drawn up the resolutions which would be submitted. At the same time they would be only too happy to receive suggestions from the shareholders, about 40 of whom (the largest shareholder among them) had sent in their proxies to the directors. One shareholder had consented to take up preference shares should they be issued. (Hear, hear.) It would have been observed that the proposition was to increase the nominal capital of the company by the sum of 12,000*l.*, divided into 6000 shares of 2*l.* each, and that the said shares should bear a preferential dividend of 15 per cent. Some might think this equivalent to 30 per cent., but if the shareholders took their proportion there could be no injustice to anyone, as they would all row in the same boat. With regard to the mine, Mr. Geech, his co-director, who had made himself thoroughly acquainted with it, and would, no doubt, have something to say about it. The other director—Mr. Bently—was unfortunately unable to be present, but he was present at the last board meeting. They had, unfortunately had an accident at the section called Potter's Pit, where it was expected a good deal of ore would be raised, but into this section some of the water from the Bog Mine had percolated. He thought if they could only raise the necessary capital they would be enabled to work more vigorously, sink the shaft, and so on. The shareholders must not think that theirs was otherwise than a progressive mine, for taking into consideration that since the formation of the company the capital had only been something like 3000*l.*, apart from the debt of the company—about 2000*l.* in all—and having raised such a large quantity of ore the mine, as the result of the small amount of capital, had been impoverished. If they had had a larger capital of course more work would have been done; for instance, the old engine-shaft would have been sunk. The shareholders should look to the fact that at Tankerville they had from sinking from the 180 to the 190—90 fms. deeper than the Pennerley workings—actually got a longer course of ore than they had had in the upper levels. It was very important that the mine should not be sacrificed, but that an effort should be made to save it. If the capital could be raised they could in all probability sink the shaft and open out more ore ground. He believed that ultimately the mine would pay. Troubles never came singly, and on Sunday last the main rod, 40 or 50 fms. deep, met with an accident. The woodwork parted, and the water was now in some 40 or 50 fms., but it seemed that only the piston has been injured, and not the cylinder, and it was thought that the engine would be at work again within a week.

Mr. LAVINGTON (at the request of the Chairman) then read a letter from Mr. A. Wallace protesting against the proposed issue of preference shares, and expressing his doubts as to the legality of such an issue.

The CHAIRMAN, in reply to Mr. E. J. Bartlett, said the total liabilities amounted to about 2000*l.*, including the Burry Port bill.

After a short discussion Mr. GEECH pointed out the great value of Potter's Pit section of the mine, showing from some plans how the dip of ore in the Tankerville Mine came in the direction of Pennerley. The characteristics of the two mines were very much alike.

Capt. HARRIS having replied to a few questions of detail, the following resolutions were carried:—"That the capital of the company be increased by the issue of 12,000*l.*, divided into 6000 shares of 2*l.* each." "That the said shares be preference shares, and entitled to a preference dividend of 15 per cent. per annum, the full nominal amount thereof in priority to any dividends on the ordinary shares." "That the new shares be treated as fully paid up on payment of 1*l.* per share thereon, the shareholder not being liable to pay the other 1*l.*" "That the new shares be in the first instance offered to the present shareholders of the company, in proportion to their holdings, and that if the offer be refused by any shareholders, the shares so refused be issued in the discretion of the directors." "That 5*s.* per share be paid on application for the new shares and 5*s.* on allotment, and the remaining 10*s.* be called up by the directors in their discretion, but no call to be made within three calendar months from the last call, or from the allotment, as the case may be." "That the preference shareholders have the right at any time, within four years from this date, to convert their shares into ordinary shares of the same amount." "That the Memorandum of Association of the company be modified so far as necessary to give effect to the foregoing resolutions."

The proceedings closed with a vote of thanks to the Chairman and directors.

NEW PRINCE OF WALES SLATE COMPANY.—At the extraordinary meeting on Wednesday (Mr. J. Turnbull in the chair), the resolution authorising the directors to affix the company's seal to a lease submitted to the meeting to be granted in pursuance of an agreement made Nov. 5, 1868, for 30 years from that date of the company's copper mines and mineral veins, except slate and slate-rock, in the estate of Rhaen-y-Pennant, in Llanfihangel-y-Pennant, Carnarvon, to the Cwm Dwyfor Copper and Silver-Lead Mines Company, was confirmed.

For remainder of Meetings see to-day's Journal.]

HOLLOWAY'S OINTMENT AND PILLS.—Bad legs, bad breasts, ulcers, abscesses, wounds, and sores of all kinds may be thoroughly healed by the application of this ointment to the parts affected, after they have been duly fomented with warm water. The discharge should not be checked at once, but rather encouraged, for any sudden check must, of course, be always dangerous. Nature is the noblest of physicians, and must not be opposed, but seconded. All sores are for a time the safety valves of the constitution, and should not be closed or healed until they assume a healthier character. Under the action of this powerful ointment, aided by the pills, the depraved humours of the body will be quickly removed.

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This justly-celebrated Rock Drill, the only one invented that will work in the hardest rock without more than the usual repairs required by any ordinary machine, is now offered to the public.

It has been most successfully worked in the well-known Hematite Mines of Lancashire and Cumberland. Will drive 50 to 60 ft. in hard rock without change of drill, and can be worked by any miner, and kept in repair by any blacksmith. It is the most simple rock drill ever invented, and cannot with fair usage get out of order.

Plans, Estimates, including Compressors, and all other Mining Machinery, supplied on application to the sole makers,—

SALMON BARNES AND CO.,

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W. and S. FIRTH undertake to CUT, economically, the hardest CANNEL, ANTHRACITE, SHALE, or ORDINARY COAL, ANY DEPTH, UP TO FIVE FEET.

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COLEBROOK'S PATENT STEAM PUMPS,

FOR HIGH OR LOW LIFTS AND GENERAL PURPOSES.

SOLE MAKERS,—

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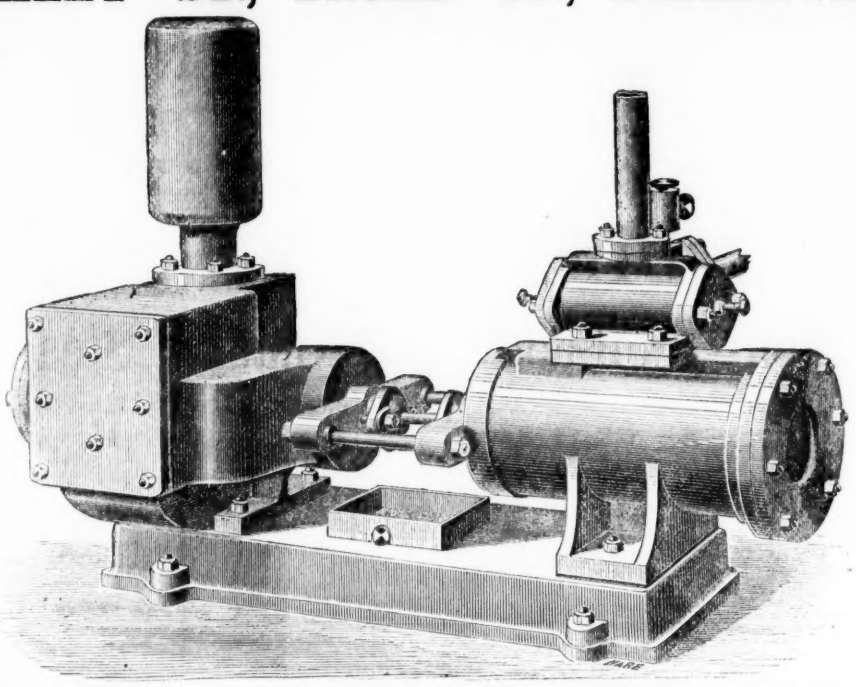
The accompanying Engraving represents a Steam Pump, suitable for general purposes; it posses-es the following advantages over any other Steam Pump yet before the public:—

1st.—No tappets, eccentrics, levers, or other mechanical appliances are used to actuate the steam slide valve, but this office is performed by the exhaust steam.

2nd.—The only working parts in the steam cylinder are the piston and slide valve, and as there are no working parts in either the piston or cylinder covers, the full length of stroke is obtained.

3rd.—The slide valve is so easy of access that it can be examined, cleaned, and replaced in a few minutes, and it is impossible to make any error in replacing it after examination, because it is immaterial which way it is inserted in the valve-box, whether one way or the other upwards, or whether end for end.



The Pump Valves are Colebrook's Patent, and are made in one piece. They are either of canvas, leather, india rubber, or other material, to suit the nature of the liquid to be pumped, and can be replaced in a very short time by any ordinary workman.

These Pumps are suitable for hot or cold water, hot or cold wort, sewage, ammoniacal liquor, tar, &c., and are adapted for use in breweries, chemical works, collieries, paper mills, dye-works, brick-yards, and for almost any other purpose.

SIZES AND PRICES OF COLEBROOK'S PATENT STEAM PUMPS.

Diameter of Steam Cylinder ..... Inches	1½	3	3	3	3	4	4	4	4	5	5	5	6	6	6	6	6	7	7	7	7	7	8
Diameter of Pump Cylinder ..... Inches	1	1½	2	2½	3	2	2½	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	
Length of Stroke ..... Inches	6	12	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	
Price	£12	£16	£17	£18	£19	£19	£20	£22	£25	£23	£28	£32	£26	£33	£36	£41	£30	£38	£41	£45	£52	£40	
Diameter of Steam Cylinder ..... Inches	8	8	8	8	9	9	9	9	9	10	10	10	10	10	10	12	12	12	12	12	12	...	
Diameter of Pump Cylinder ..... Inches	5	6	7	8	5	6	7	8	9	5	6	7	8	9	10	6	7	8	9	10	12	...	
Length of Stroke	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	...	
Price	£45	£50	£56	£65	£50	£55	£60	£70	£81	£62	£68	£70	£80	£95	£100	£80	£85	£90	£100	£115	£135	...	

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This company now undertake the sinking of Artesian Wells. Their system rivals all others, both for efficiency and speed, and in addition produces "Solid Cores" from the Rocks bored through, thus giving invaluable evidence of the strata passed through as the work progresses.—Vide *Brewers' Journal*, October, 1876, and other papers.

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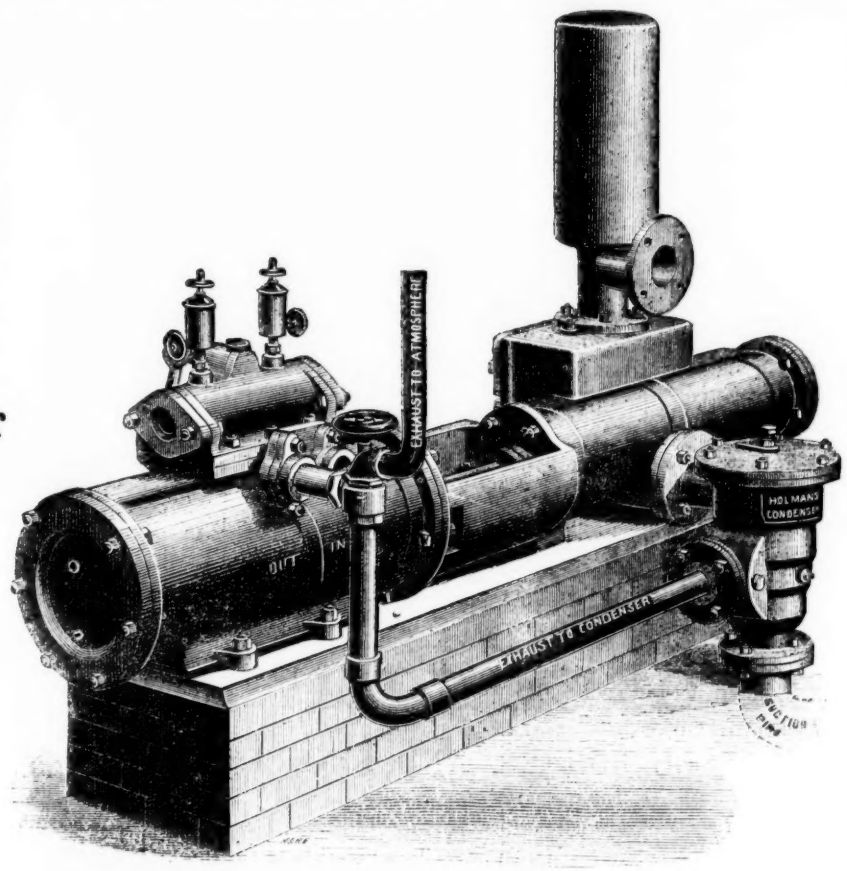

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Are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

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The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of Stroke .....In.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,500	5070	7330
Price of Special Pump ...£	**16**	**18**	**20**	**25**	**22 10**	**27 10**	**32 10**	**25**	**30**	**35**	**40**	**30**	**35**	**40**	**45**	**50**	**40**	**45**	**50**	**55**	**65**	**50**	**55**	**60**	**70**	**85**	**55**	**60**
Extra, if fitted with Holman's Condenser and Blow-through Valve	£7	£7	£9	£11	£8 10	£11 10s	£12 10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17	£17

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18
Diameter of Water Cylinder..In	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14
Length of Stroke .....In	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000
Price of Special Pump..£	**65**	**75**	**90**	**100**	**75**	**80**	**85**	**110**	**120**	**140**	**110**	**120**	**130**	**140**	**160**	**180**	**140**	**150**	**160**	**180**	**200**	**180**	**190**	**210**	**230**
Extra, if fitted with Holman's Condenser and Blow-through Valve	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£55	£28	£40	£40	£55	£55	£45	£45	£56	£60

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

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Messrs. TANGYE BROTHERS AND HOLMAN.

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(Signed) J. THOMPSON.

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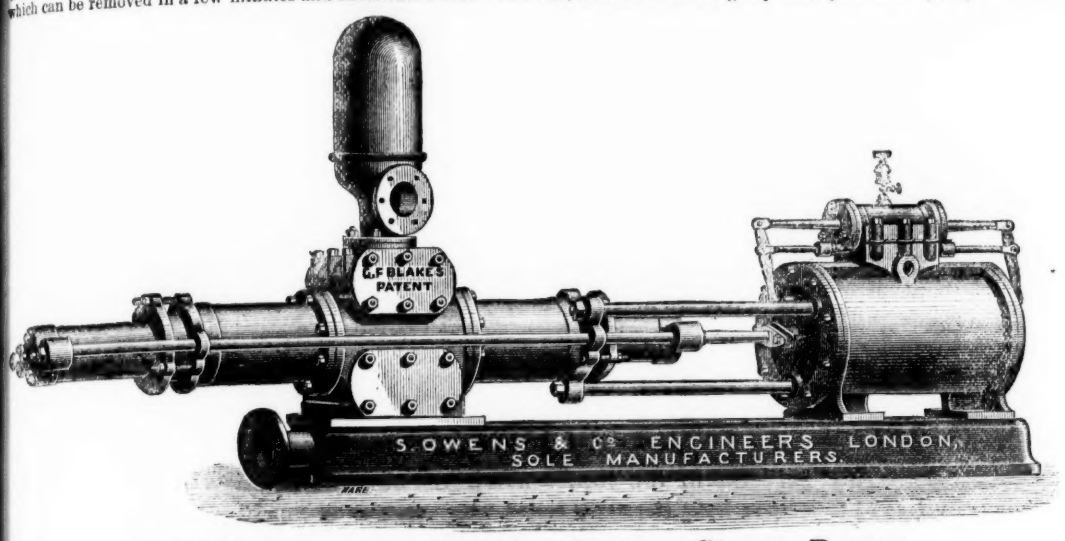

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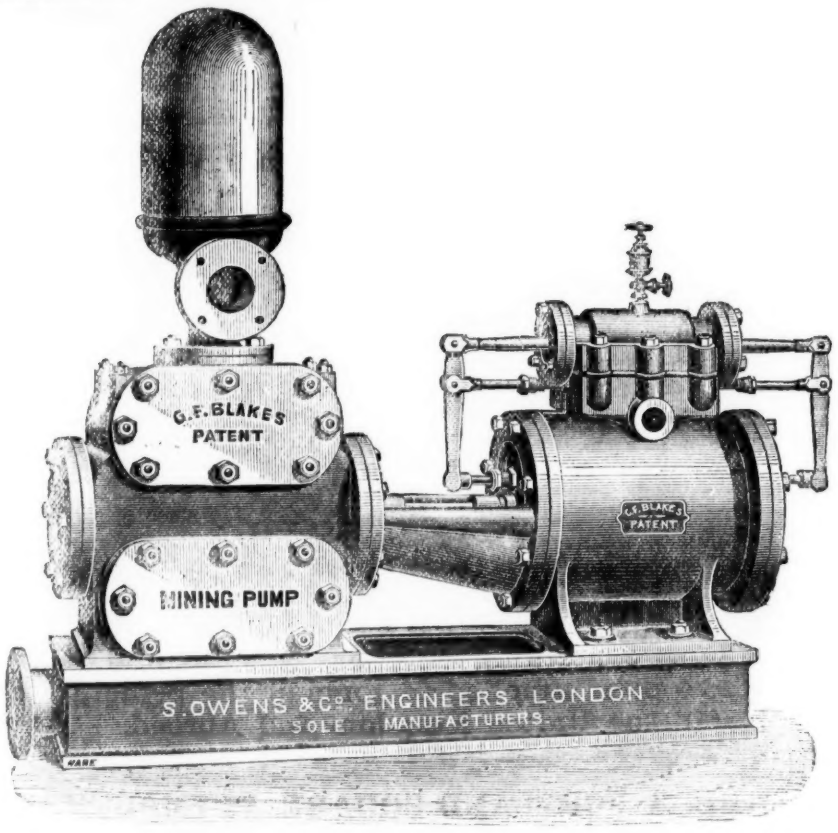

Blake's Improved Mining Pump, with Patent Removeable Lining to Pump Cylinder,

Any combination of these Pumps may be had to suit circumstances. The following are some of the SIZES SUITABLE FOR MINING PURPOSES:—

Dia. of steam cylinders.. In.	12	12	12	12	14	14	14	16	16	16	16	18	18	18	18	20	20	20	20	24	24
Dia. of water cylinders.. In.	3	4	5	6	4	5	6	4	5	6	8	4	5	6	8	5	7	8	9	6	8
Length of stroke ... ... In.	18	18	18	24	24	24	24	24	24	24	24	24	30	30	30	30	30	36	36	36	42
No. of strokes per minute..	30	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17	15
Quantity in gallons per hour, approxmately ...	1440	2610	4200	5940	2940	4620	6600	2646	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15660	6720	12000

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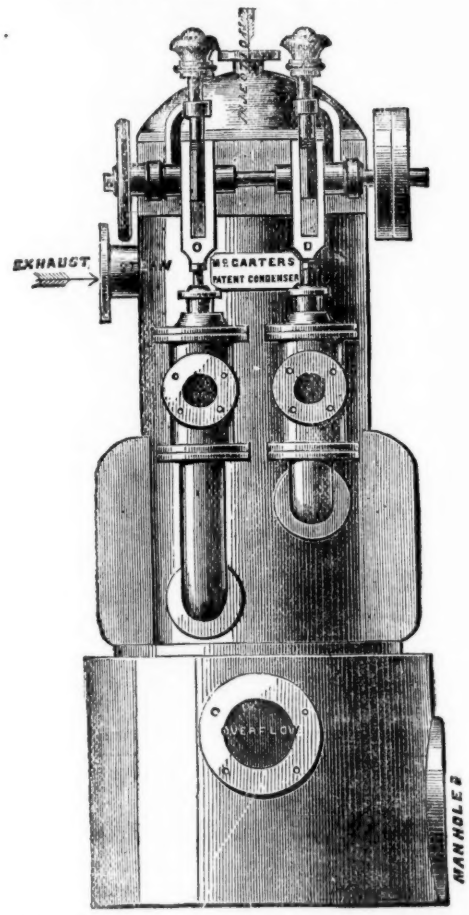

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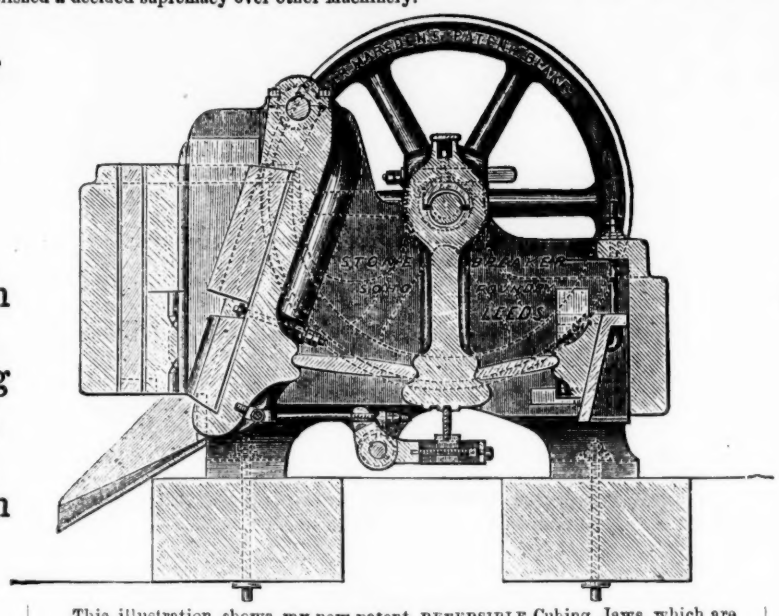

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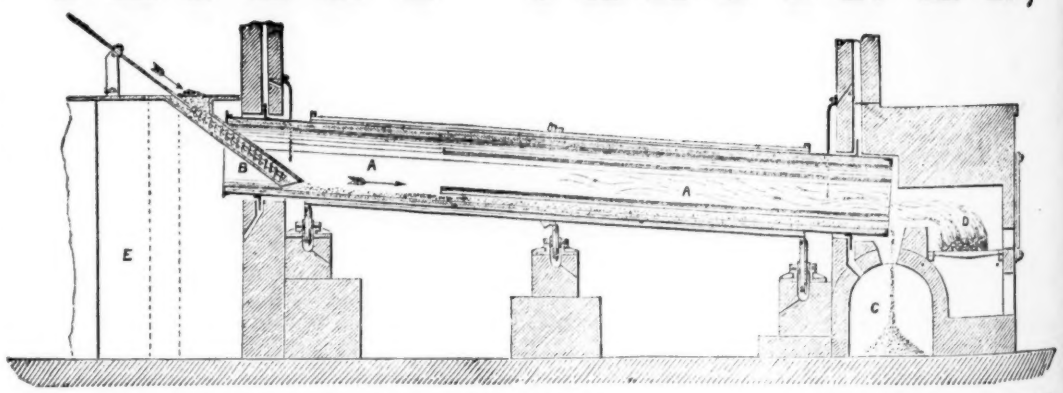

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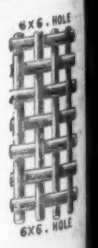

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